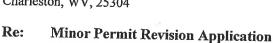


MarkWest Liberty Gas Gathering Company, L.L.C. 1515 Arapahoe Street
Tower 1, Suite 1600
Denver, CO 80202-2137
(800) 730-8388
(303) 290-8700
(303) 825-0902 Fax

December 7, 2016

Mr. Fred Durham, Director
Department of Environmental Protection
Division of Air Quality – Air Permitting Section
601 – 57<sup>th</sup> Street, SE
Charleston, WV, 25304



MarkWest Liberty Midstream & Resources, LLC - Majorsville Gas Plant

Permit No. R13-2818D

Dear Mr. Durham

Enclosed is an application for permit revisions to the MarkWest Liberty Midstream & Resources, L.L.C. Majorsville Gas Plant located near Majorsville, in Marshall County.

This application includes all the applicable attachments identified by the WVDEP permitting guidance. A check for \$2,000 is included with this application.

MarkWest has previously built and is operating the Majorsville I, II, III, IV, V and VI plants. MarkWest is requesting the following revisions be made as part of this application to the existing permit (R13-2818C) to reflect the addition of one depropanizer (cryogenic plant), referred to as Majorsville VII, and the addition of one deethanizer at the Majorsville Gas Plant. The Majorsville VII plant was previously permitted; however, construction was stopped for over 18 months and MarkWest is submitting this application to restart the clock. This application is identical to the previous application with regard to Majorsville VII.

- Installation of one new Depropanizer processing trains to remove liquids from gas streams, rated at 230 mmscf/d;
- Installation of the following process heaters to support the Depropanizers: one regenerator rated at 7.69 mmbtu/hr, and one hot oil heaters at 16.07 mmbtu/hr;
- Installation of one heater rated at 14.25 mmbtu/hr and one heater rated at 119.20 mmbtu/hr for the addition of the deethanizer;
- Modification of component fugitives to reflect the new processes;
- Addressing findings from an April 2016 audit.



The remaining equipment at the Majorsville complex will remain the same as currently permitted. In addition to the items listed above MarkWest requests the following administrative corrections be made to the issued permit.

- C-102, C-103 and C-104 Section 1.0 "Emission Units" lists these units as utilizing selective catalytic reduction ("SCR"). These units are equipped with oxidation catalysts.
- C-102, C-103 and C-104 Permit Condition 5.1.3a lists requirements for SCR and ammonia slip. This is not applicable as the units are equipped with oxidation catalysts and not SCR.
- G-OSBL, G-ISBL Permit Condition 11.0 lists 40 CFR Part 60 Subpart OOOO as applicable to the diesel generator engines. There are no requirements in 40 CFR Part 60 Subpart OOOO that apply to diesel generators.
- F-991, FL-1991 (FL-3991 in permit) Permit Condition 7.1.4 lists emission limits from the flares. The limits listed are based only on emissions from the pilots, but are not explicitly stated as such. Markwest requests replacement of the word "control device" with "pilot" for clarity.
- FL-1991 (FL-3991 in permit) FL-3991 is not installed at the facility. FL-1991 is installed.
- H-6782 –Section 1.0 "Emissions Units" lists H-6782 however, the unit was never installed.
- H-1741 –Section 1.0 "Emissions Units" lists H-1731 as the emission ID for the Deethanizer Regen Heater however the correct emission ID is H-1741.

If you have any questions concerning this application, please contact me at (303) 542-1212.

Thank you for your attention.

Sincerely, Path for Wade Janecek.

Wade Janecek

Senior Environmental Engineer

MarkWest Liberty Midstream & Resources, L.L.C.

## Permit to Modify Application

## MarkWest Energy Appalachia, LLC Majorsville Gas Plant

Plant ID.: 051-00125 Permit No.: R13-2818C

Majorsville, Marshall County, West Virginia

November 2016

#### MarkWest Liberty Midstream & Resources L.L.C. Majorsville Gas Plant- 45CSR13 Permit Application

#### **Table of Contents**

## **Application For Permit**



#### WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

#### **DIVISION OF AIR QUALITY**

601 57<sup>th</sup> Street, SE Charleston, WV 25304 (304) 926-0475www.wvdep.org/daq

# APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO NSR (45CSR13) (IF KNOWN):  ☑ CONSTRUCTION ☑ MODIFICATION ☐ RELOCATION ☐ CLASS I ADMINISTRATIVE UPDATE ☐ TEMPORARY ☐ CLASS II ADMINISTRATIVE UPDATE ☐ AFTER-THE-FACT	☐ ADMINISTRATION OF ADMINISTR	CHECK TYPE OF 45CSR30 (TITLE V) REVISION (IF ANY): INISTRATIVE AMENDMENT MINOR MODIFICATION IFICANT MODIFICATION BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION ATION AS ATTACHMENT S TO THIS APPLICATION		
FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revisio (Appendix A, "Title V Permit Revision Flowchart") and ability to	on Guidance" in or o operate with the	der to determine your Title V Revision options changes requested in this Permit Application.		
Section I	l. General			
<ol> <li>Name of applicant (as registered with the WV Secretary of Sta MarkWest Liberty Midstream &amp; Resources L.L.C.</li> </ol>	ate's Office):	2. Federal Employer ID No. (FEIN): 3 0 0 5 2 8 0 5 9		
Name of facility (if different from above):     Majorsville Gas Plant		4. The applicant is the:  ☐ OWNER ☐ OPERATOR ☑ BOTH		
5A. Applicant's mailing address: 1515 Arapahoe St., Tower 1, Suite 1600 Denver, CO. 80202-2137  5B. Facility's present physical address:				
<ul> <li>6. West Virginia Business Registration. Is the applicant a residence.</li> <li>If YES, provide a copy of the Certificate of Incorporation/Or change amendments or other Business Registration Certificate.</li> <li>If NO, provide a copy of the Certificate of Authority/Authorical amendments or other Business Certificate as Attachment A.</li> </ul>	rganization/Limit ite as Attachment ity of L.L.C./Regi	ted Partnership (one page) including any name t A.		
7. If applicant is a subsidiary corporation, please provide the name	e of parent corpor	ration:		
<ul> <li>8. Does the applicant own, lease, have an option to buy or otherw</li> <li>If YES, please explain: Applicant has contract to lease t</li> <li>If NO, you are not eligible for a permit for this source.</li> </ul>		of the proposed site? XYES NO		
<ol> <li>Type of plant or facility (stationary source) to be constructed, administratively updated or temporarily permitted (e.g., co primary crusher, etc.): Natural gas processing plant</li> </ol>	modified, reloca	ated, 10. Standard Industrial Classification (SIC) code for the facility:  1311		
	ated with this proc	and 45CSR30 (Title V) permit numbers ess (for existing facilities only):		
All of the required forms and additional information can be found und	der the Permitting	Section of DAQ's website, or requested by phone.		



12A.		
For Modifications, Administrative Updates of present location of the facility from the nearest.		cility, please provide directions to the
For Construction or Relocation permits, plear road. Include a MAP as Attachment B.		new site location from the nearest state
1700 Majorsville Rd, Dallas, WV. 26036		
Troo majorovine ra, banas, vv. 2000		
12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
	Majorsville	Marshall
12.E. UTM Northing (KM): 4423828.5	12F. UTM Easting (KM): <b>540947.0</b>	12G. UTM Zone: 17
13. Briefly describe the proposed change(s) at the fa	•	
Facility will be constructing one new depro Additionally, an additional deethanizer will be co		
14A. Provide the date of anticipated installation or c		14B. Date of anticipated Start-Up if a
<ul> <li>If this is an After-The-Fact permit application, proposed change did happen: / /</li> </ul>	provide the date upon which the	permit is granted:  December 11, 2017
14C. Provide a Schedule of the planned Installation application as Attachment C (if more than one	-	the units proposed in this permit
15. Provide maximum projected Operating Schedu		oplication:
Hours Per Day 24 Days Per Week	· · · · · · · · · · · · · · · · · · ·	
16. Is demolition or physical renovation at an existin	g facility involved?   YES	NO
17. Risk Management Plans. If this facility is subject changes (for applicability help see www.epa.gov/c	**	•
18. Regulatory Discussion. List all Federal and Sta	ate air pollution control regulations that	you believe are applicable to the
proposed process (if known). A list of possible ap	olicable requirements is also included in	Attachment S of this application
(Title V Permit Revision Information). Discuss app	licability and proposed demonstration(s	s) of compliance (if known). Provide this
information as Attachment D.		
	attachments and supporting	
<ol> <li>Include a check payable to WVDEP – Division of 45CSR13).</li> </ol>	Air Quality with the appropriate applica	tion fee (per 45CSR22 and
Include a Table of Contents as the first page of your	application package.	
Provide a <b>Plot Plan</b> , e.g. scaled map(s) and/or sketc or is to be located as <b>Attachment E</b> (Refer to <b>Pl</b>		rty on which the stationary source(s) is
<ul> <li>Indicate the location of the nearest occupied structure.</li> </ul>	ture (e.g. church, school, business, res	idence).
Provide a Detailed Process Flow Diagram(s) show device as Attachment F.	ng each proposed or modified emissior	ns unit, emission point and control
Provide a Process Description as Attachment G.		
<ul> <li>Also describe and quantify to the extent possil</li> </ul>		
All of the required forms and additional information cal	n be found under the Permitting Section of	of DAQ's website, or requested by phone.
Provide Material Safety Data Sheets (MSDS) for all		as Attachment H.
- For chemical processes, provide a MSDS for each	compound emitted to the air.	

Fill	out the <b>Emission Units Table</b> and	provide it as Attachment I.		
Fill out the Emission Points Data Summary Sheet (Table 1 and Table 2) and provide it as Attachment J.				
Fill	out the Fugitive Emissions Data	Summary Sheet and provide it	as Attachment K.	
Che	ck all applicable <b>Emissions Unit</b> l	Data Sheets listed below:		
	Bulk Liquid Transfer Operations	☐ Haul Road Emissions	☐ Quarry	
	Chemical Processes	☐ Hot Mix Asphalt Plant	Solid Materia	als Sizing, Handling and Storage Facilities
	Concrete Batch Plant	☐ Incinerator	☐ Storage Tan	ks
	Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger		
	Seneral Emission Unit, specify He	aters.		
Fill c	out and provide the Emissions Un	it Data Sheet(s) as Attachmen	t L.	
Che	ck all applicable Air Pollution Cor	ntrol Device Sheets listed below	w:	<u> </u>
	bsorption Systems	☐ Baghouse		⊠ Flare
	dsorption Systems	☐ Condenser		☐ Mechanical Collector
	fterburner	☐ Electrostatic Precipitat	ог	☐ Wet Collecting System
	other Collectors, specify Flare as c	ontrol device.		·
	ut and provide the Air Pollution C			- 8
	ide all Supporting Emissions Ca through 31.	lculations as Attachment N, o	r attach the calcula	ations directly to the forms listed in Items 28
Monitoring, Recordkeeping, Reporting and Testing Plans. Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as Attachment O.				
Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.				
32.	Public Notice. At the time that th	ne application is submitted, place	a Class I Legal A	Advertisement in a newspaper of general
,	circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and Example Legal			
4	Advertisement for details). Please submit the Affidavit of Publication as Attachment P immediately upon receipt.			
33. Business Confidentiality Claims. Does this application include confidential information (per 45CSR31)?				
	☐ YES	s 🛛 NO		2
▶ If YES, identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's "Precautionary Notice - Claims of Confidentiality" guidance found in the General Instructions as Attachment Q.				
_		Section III. Certificatio	n of Informatio	on
	ority/Delegation of Authority. Capplicable Authority Form below:		er than the respon	sible official signs the application. Check
□А	☐ Authority of Corporation or Other Business Entity ☐ Authority of Partnership			rship
	uthority of Governmental Agency		Authority of Limited	Partnership
Submit completed and signed Authority Form as Attachment R.				
All o	f the required forms and additional i	information can be found under th	ne Permitting Section	on of DAQ's website, or requested by phone.

35A. Certification of Information. To a 2.28) or Authorized Representative shall	certify this permit application, a Responsible check the appropriate box and sign below.	e Official (per 45CSR§13-2.22 and 45CSR§30-		
Certification of Truth, Accuracy, and Completeness				
I, the undersigned Responsible Official / Authorized Representative, hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.				
Compliance Certification				
Except for requirements identified in the Title \ information and belief formed after reasonable requirements.	inquiry, all air contaminant sources identified in	ed, I, the undersigned hereby certify that, based on this application are in compliance with all applicable		
SIGNATURE Sesume of	Lui .	DATE: 12-5-16		
le sessione de la constante de	lease use blue ink)	(Please use blue ink)		
35B. Printed name of signee: Leanne Me		· · · · · · · · · · · · · · · · · · ·		
33b. Finited hame of signee. Learne Me	yer	35C. Title: VP of EH&S		
35D. E-mail: <u>Imeyer@markwest.com</u>	36E. Phone: (303) 925-9299	36F. FAX: (303) 825-0920		
36A. Printed name of contact person (if di	fferent from above): Wade Janecek	36B. Title: Senior Environmental Engineer		
36C. E-mail: Wade.Janecek@markwest.com	36D. Phone: (303) 542-1212	36E. FAX: (303) 825-0920		
	•			
PLEASE CHECK ALL APPLICABLE ATTACH	MENTS INCLUDED WITH THIS PERMIT APPLI	CATION:		
<ul> <li>✓ Attachment A: Business Certificate</li> <li>✓ Attachment B: Map(s)</li> <li>✓ Attachment C: Installation and Start Up Schedule</li> <li>✓ Attachment D: Regulatory Discussion</li> <li>✓ Attachment E: Plot Plan</li> <li>✓ Attachment F: Detailed Process Flow Diagram(s)</li> <li>✓ Attachment B: Attachment B: Material Safety Data Sheets (MSDS)</li> <li>✓ Attachment I: Emission Units Table</li> <li>✓ Attachment C: Fugitive Emissions Data Summary Sheet</li> <li>✓ Attachment M: Fugitive Emissions Data Summary Sheet</li> <li>✓ Attachment M: Fugitive Emissions Data Summary Sheet</li> <li>✓ Attachment M: Air Pollution Control Device Sheet(s)</li> <li>✓ Attachment N: Supporting Emissions Calculations</li> <li>✓ Attachment N: Supporting Emissions Calculations</li> <li>✓ Attachment P: Public Notice</li> <li>✓ Attachment P: Public Notice</li> <li>✓ Attachment Q: Business Confidential Claims</li> <li>✓ Attachment R: Authority Forms</li> <li>✓ Attachment R: Authority Forms</li> <li>✓ Attachment S: Title V Permit Revision Information</li> <li>✓ Application Fee</li> </ul>				
Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.				
COD ACCINOVUOE ON A TENERO				
FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:  Forward 1 copy of the application to the Title V Permitting Group and:  For Title V Administrative Amendments:  NSR permit writer should notify Title V permit writer of draft permit,  For Title V Minor Modifications:  Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,  NSR permit writer should notify Title V permit writer of draft permit.				
For Title V Significant Modifications proces	use v permit writer of draft permit.	j		
☐ For Title V Significant Modifications processed in parallel with NSR Permit revision: ☐ NSR permit writer should notify a Title V permit writer of draft permit,				
□ Public notice should reference both 45CSR13 and Title V permits,				
EPA has 45 day review period of a draft permit.				
		ction of DAQ's website, or requested by phone.		

## **Application Checklist**

	45CSR13 PERMIT APPLICATION CHECKLIST
su	complete application is demonstrated when all of the information required below is properly prepared, completed and attached. The items listed below are required information which must be submitted with a 45CSR13 permit application. Any bmittal will be considered incomplete if the required information is not included. The applicant must submit a complete application in order to receive a 45CSR13 permit.
<b>Y</b>	Class I legal advertisement published in a newspaper certified to accept legal advertisements and original affidavit submitted for Class II administrative updates, temporary and relocation permits, and general permit registrations.
	\$1,000 application fee for construction, modification, relocation or temporary permit; \$300 application fee for Class II administrative update. Additional applicable fees:
V	<ul> <li>\$1,000 NSPS</li> <li>\$5,000 Major Modification</li> <li>\$2,500 NESHAP</li> <li>\$10,000 Major Construction</li> <li>\$2,500 45CSR27 Pollutant</li> </ul>
<b>V</b>	Original and three (3) copies of the application.
V	File organization – application pages are numbered and in correct order, application is bound in some way, etc.
V	Confidential Business Information is properly identified.
V	General application forms signed by a responsible official.
V	<ul> <li>Authority form – required if application is signed by someone other than a responsible official – one of the following:         <ul> <li>Authority of Corporation if application is not signed by the President or CEO;</li> <li>Authority of Partnership if application is not signed by a general partner or proprietor;</li> <li>Authority of Limited Partnership if application is not signed by general partner or proprietor; or</li> <li>Authority of Governmental Agency if application is not signed by principal elected officer or ranking elected official.</li> </ul> </li> </ul>
V	Copy of current Business Registration Certificate.
V	Process description, including equipment and emission point identification numbers.
V	Process flow diagram, including equipment and emission point identification numbers.
<b>V</b>	Plot plan, including equipment and emission point identification numbers.

V	Area map with directions and location marked.
	Applicable technical forms completed and submitted:
	<ul> <li>Emission Point Data Summary Sheets</li> <li>Emission Unit Data sheets</li> <li>Air Pollution Control Device Sheets</li> <li>Equipment List Form</li> </ul>
V	Emission calculations – emission factors, references, source identification numbers, etc.

#### **Attachment A: Certificate of Authority**



#### I, Natalie E. Tennant, Secretary of State of the State of West Virginia, hereby certify that

#### MARKWEST LIBERTY MIDSTREAM & RESOURCES, L.L.C. Control Number: 9905Y

a limited liability company, organized under the laws of the State of Delaware has filed its "Application for Certificate of Authority" in my office according to the provisions of West Vuginia Code §31B-10-1002. I hereby declare the organization to be registered as a foreign limited liability company from its effective date of February 5, 2009, until a certificate of cancellation is filed with our office.

Therefore, I hereby issue this

#### CERTIFICATE OF AUTHORITY OF A FOREIGN LIMITED LIABILITY COMPANY

to the limited liability company authorizing it to transact business in West Virginia



Given under my hand and the Great Seal of the State of West Virginia on this day of February 5, 2009

Natelil Element

Natalie E. Tennant Scorstary of State State Capitol Bubding 1900 Kanswite Blvd. East Charloston, WV 25305-0770

The mane of the company as registered in its home ctate is:
 and the risks or country of organization is:

The makes to be used in West Virginia will be: The same most enough and of the required series sodi as Tailland inhibity company" or other factors so in as LLCC of Tallact. See lativations for compile life of acceptable issues and requirements for one of trade factors (DAAS)

The community will be a: (See instruction for Entertors on professions saids any Stree P.L.L.G. is W.Vs. All searchers must have WV professional George.)

4. The address of the designated office of the company in WV, if any, will be [seed not be a place of the company's business]

5. The street address of the principal effice in

and the mailing address (if differed) is:

6. The name and address of the initial agent of process, if any, is:

The malling address of the above agent of process, if different, is:

7. The company is:

FORK LLF-I

WEST VIRGINIA

APPLICATION FOR

CERTIFICATE OF AUTHORITY

Penney Barket, Manager
Corporations Division
Tel: (204) 858-8200
Fac: (204) 858-8201
Hours: 8:30 s.m. - 6:00 p.m. ET

OFLIMITED LLA

www.com OFI	IMITED LIABILIT	YCOMPANY	Control 9 9205 4
**A certificate of existence tax year,	rom your home state of must be included with ti	organization, dated ils application.**	during the current
be same of the company as regist	red in its Markin	ost Liberty Midstream & Red	sources, L.L.C.
ome ctate is: ul the maio or country of organiza	ion is: Delay	/ATB	•
no make to be used in West Virgi as axes must contak not of the pophed ter- sitiv company or obvertation such as LLC tructions for complete list of acceptable form one of trade forms (OOA);	erote or "Estled V nome	state name as listed above,	if available in W. Vs.
os company will be a: [see instacts profesion which may sam P.L.C. is W.V. at have WV profesional Second)	All sembon	LLC. coal LLC. for the profits	ken of
o address of the designated offic company in WV, if any, will be; (so be a piece of the company's business)		†E	
e stroct address of the principal of	January 1818 AN	roebos Bl. Towns 2, Sulls Zi CO 8t202	32
name and address of the initial age rocess, if any, is:	707 Vigit	neden Syntam die Etreel East, 10th Floor n, WV 25501	FILED
malling address of the above at of process, if different, is:		.IN SEC	THE OFFICE OF HETARY OF STATE
company is:	- ليكا	ny, for an indufficite peri for the term of	
	which will expire	00	

Sensed by the Secretary of Store, State Chiphol, Cherleson, WV 23305-0770

W. VA. APPLICATION FOR CHRIT	FICATE OF AUTHORITY C	FUTD. LIABILITY CO.	Page 2
8. The Company is:	member-mens	ged. "[List the names and address explority susch structures l'arceded]	esce of <u>all</u> members
Name	memager-manag	ed. (List he mines and editories of a standard page (Located) Address	d mentgers who have
MarkY(ast Ularry Gas Gelhedng, L.L.C.	15(5 Arapahow St., To	44r 2, 50ta 700, Denilia, CO 8020	22
9. All or specified members of a limited liability company are liable in their constity as members for all or spec- debts, obligations or liabilities of the	Stied NO - Alideba		
company.	1122 - 10029 b	erions who are liable in their s for all dobts, obligations or shave consented in writing to also of to be bound by the provi-	r capacity as lability of the the adoption of you
<ol> <li>The purpose for which this limited li- (Describe the type(s) of humber set and commercial buildings, " spenne</li> </ol>	fully which will be conducted, for relat principe. "Professional pra-	r mazzola, "real estata A "constro	ction of residential
Natural gas midstream service	ıs 🤃		
11. The number of pages attached and i	ncluded in this application is	And the second	. a.
12. The requested data for the each lishment of the limited lishifty company in West Virginia to:	the filter & since of the following title		Carp effection
13. Enter the number of scree the compan	y dealres to hold in West Virgin	la. If your company holds more	thin 10,000
ectes of prud Aou until supury a teo o	of 5¢ for each sore aver 10,000.	100	
	₩.		
14. Contact and Signature informati a, Contact person to reach in case the		ng (Qippin) Sa	
Phone # (303) 925-9304	att in out in the seasons a		The same
b. Signature of manager of a manager	manafeq comban's memper o	La memper-ménabeq combed	N betadd
organizing the company, if the com-	eny man not begin formed or all	one to fact for son of the ab	OVE-
Andrew Schroeder.	VP Firence & Young		44.
Name [print or type]	Title/Capacity	Signature	
		る。かられる機能を	4 <b>3.</b> " - 6



I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAMARE, DO BERKEY CERTIFY "MARKMEST LIBERTY MIDSTREAM & RESOURCES, L.L.C." IS DULY FOREST UNDER THE LAMS OF THE STATE OF DELAMARE AND IS IN GOOD STANDING AND HAS A LEGAL EXISTENCE SO HAR AS THE RECORDS OF THIS OFFICE SHOW, AS OF THE THERTY-SIXTE DAY OF JANUARY, A.D. 2009.

And I do hereby further certify that the annual taxes have not been assessed to date.

AND I DO MEREBY FORTHER CERTIFY THAT THE SAID "MANDOWSS" LIBERTY MIDSTEAM & RESOURCES, L.L.C." WAS FORMED ON THE IMPRILIESE DAY OF JANUARY, A.D. 2009.

4646510 8300

090063907

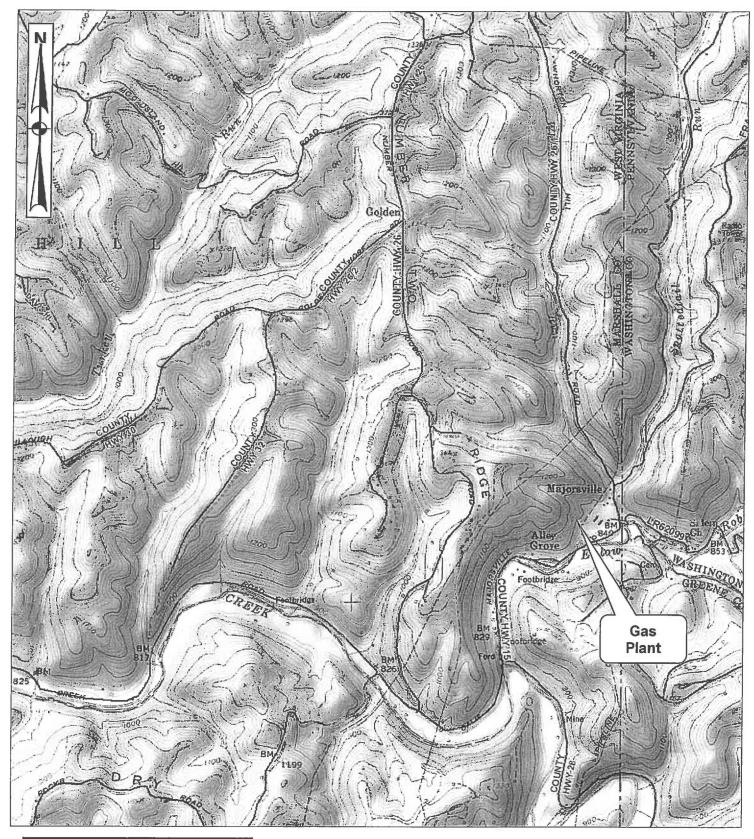
You may runity this gertificate colices at comp. delaware, per/suther. sheal

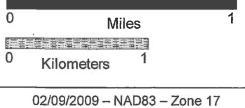
AUTHENTE CATION: 7098568

DATE: 01-26-09

13

### Attachment B: Site Map





## MARKWEST

Attachment B- Site Map
MarkWest Liberty Midstream
& Resources, L.L.C.
Majorsville Gas Plant

### **Attachment C: Installation and Start Up Schedule**

#### Attachment C: installation and Start-Up Schedule

MarkWest Liberty Midstream & Resources L.L.C. is commencing earthwork and intends to commence construction activities on the next phase of the Majorsville Plant expansion in 4<sup>th</sup> quarter 2017.

Start up of the new equipment being added to the Majorsville facility is anticipated for December 11, 2017.

## **Attachment D: Regulatory Discussion**

#### Attachment D: Regulatory Discussion

MarkWest Liberty Midstream & Resources LLC has reviewed the regulatory provisions noted in the Title V Revision Information (Appendix S) consideration and offers the following discussion concerning each of those regulatory provisions:

**State Implementation Plan**- This application does not involve a stationary source to be located in a non-attainment area subject to a SIP.

**Federal Implementation Plan-** No Federal Implementation Plan is in effect where this stationary source is proposed.

Minor source NSR (45CSR13) - This application is submitted in compliance with 45CSR13.

PSD (45CSR14) - The proposed modification to this source will not cause it to be a major source subject to the provisions of the PSD rule.

**NESHAP** (45CSR15) - The proposed modification to this facility will not subject it to the NESHAP provisions.

**Nonattainment NSR (45CSR19)** - This facility is located in a non-attainment area for PM. The limits in this permit are beneath the major source thresholds for PM and NOx.

**Section 111 NSPS** - The existing portions of the facility are subject to the provisions of NSPS Subpart KKK regarding Equipment Leaks of VOC from Onshore Natural Gas Processing Plants. NSPS Subpart OOOOa will be applicable for the portion of the plant that is being newly constructed.

NSPS Subpart JJJJ also applies to the natural gas fired engines.

**Section 112(d) MACT standards -** This facility is not a major source of hazardous pollutants and is not subject to the MACT provisions.

**Section 112(g) Case-by-case MACT -** This facility is not a major source of hazardous pollutants and is not subject to the MACT provisions.

112(r) RMP- This source currently is and will be subject the RMP requirements in 40 CFR 68.

**Section 112(i) Early Reduction of HAP -** This facility is not a major source of hazardous air pollutants and is not subject to this provision.

**Consumer/commercial product requirements, section 183(e)** - This facility does not involve the manufacture or sale of consumer or commercial products and is not subject to this regulatory provision.

**Section 129 Standards/requirements** - This facility does not involve solid waste combustion or incineration, therefore this standard does not apply.

**Stratospheric ozone (Title VI)** - This facility does not use class I ozone depleting substances (ODSs) including chlorofluorocarbons (CFCs) and class II ODSs, which are hydrochlorofluorocarbons (HCFCs), so this provision does not apply.

Tank vessel requirements, section 183(f) - This facility does not employ marine tank vessels so this provision does not apply.

Emissions cap 45CSR§30-2.6.1- This facility is not subject to any emissions caps as provided by this provision.

NAAQS, increments or visibility (temp. sources)- This facility will not emit emissions in any quantity with the potential to affect compliance with the NAAQS, increments of consumption or air quality related values (AQRVs).

**45CSR27 State enforceable only rule-** This facility will have some unquantified emissions of benzene that will be controlled through the 40 CFR 60 Subpart KKK leak detection and repair program. Formaldehyde may be formed through the combustion process in the proposed compressor engine, the formaldehyde emissions will be controlled by the use of an oxidation catalyst.

**45CSR4 State enforceable only rule-** Normal operations of this facility are not expected to generate objectionable odors.

Acid Rain (Title IV, 45CSR33) - This facility is not a source subject to the provision of the Acid Rain program.

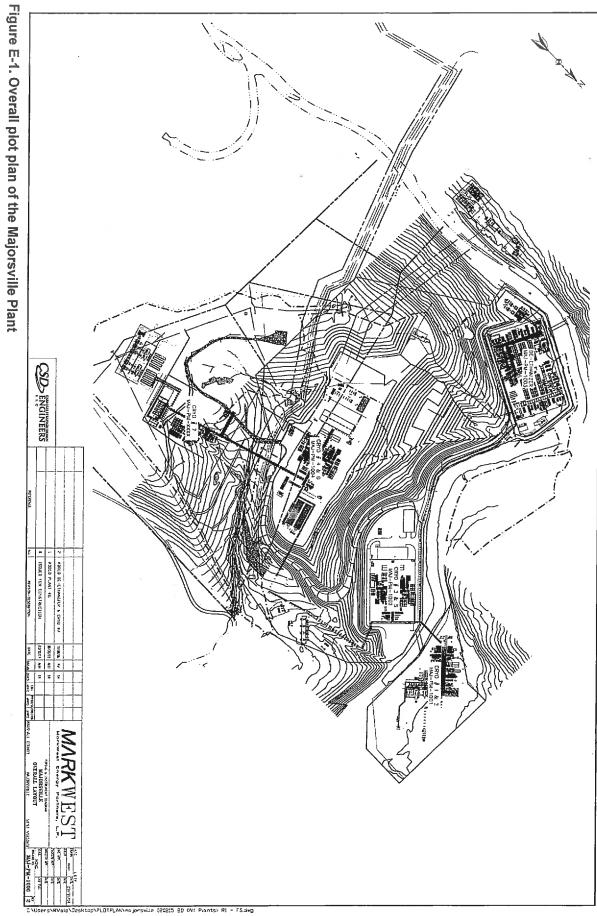
Emissions Trading and Banking (45CSR28) - The applicant for this facility does not voluntarily choose to participate in an emission reduction credit trading program.

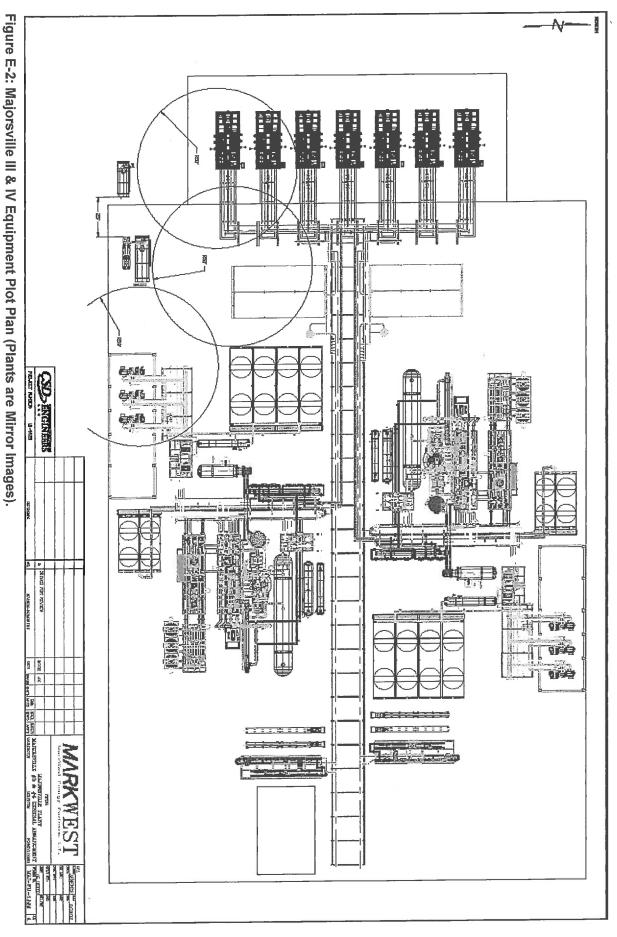
Compliance Assurance Monitoring (40CFR64) - This facility is not a major source required to obtain a part 70 or 71, and therefore is not an affected facility under this provision.

NOx Budget Trading Program Non-EGUs (45CSR1) – This facility is not a source located in a non-attainment area that is subject to the nitrogen oxides (NOX) SIP Call. Therefore this provision does not apply.

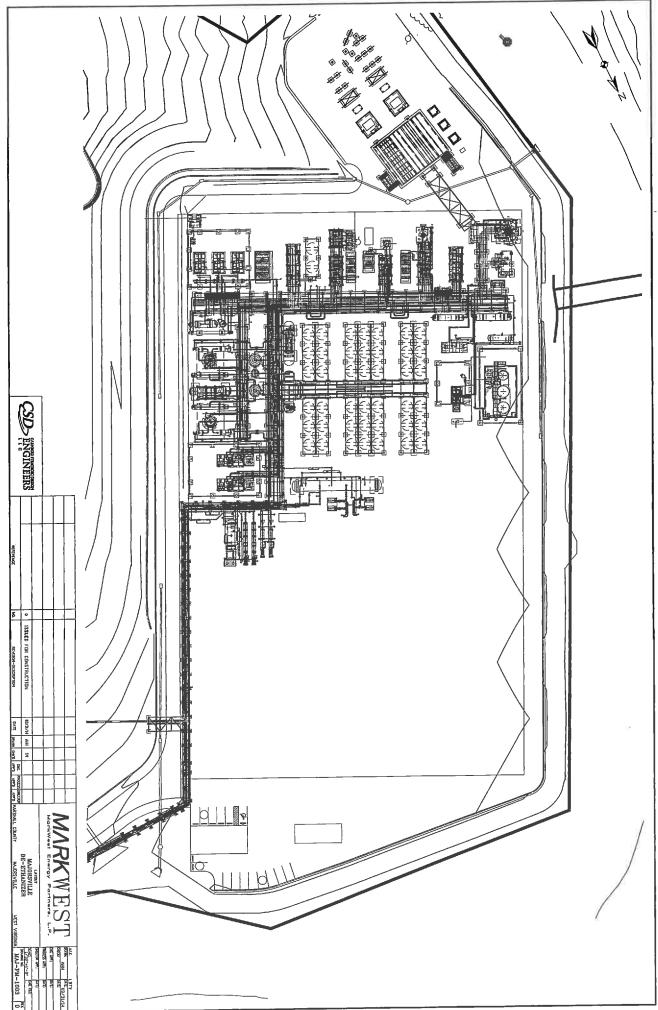
NOx Budget Trading Program EGUs (45CSR26) - This facility is not an electric generating unit subject to the nitrogen oxides (NOX) SIP Call, and is not a source subject to this provision.

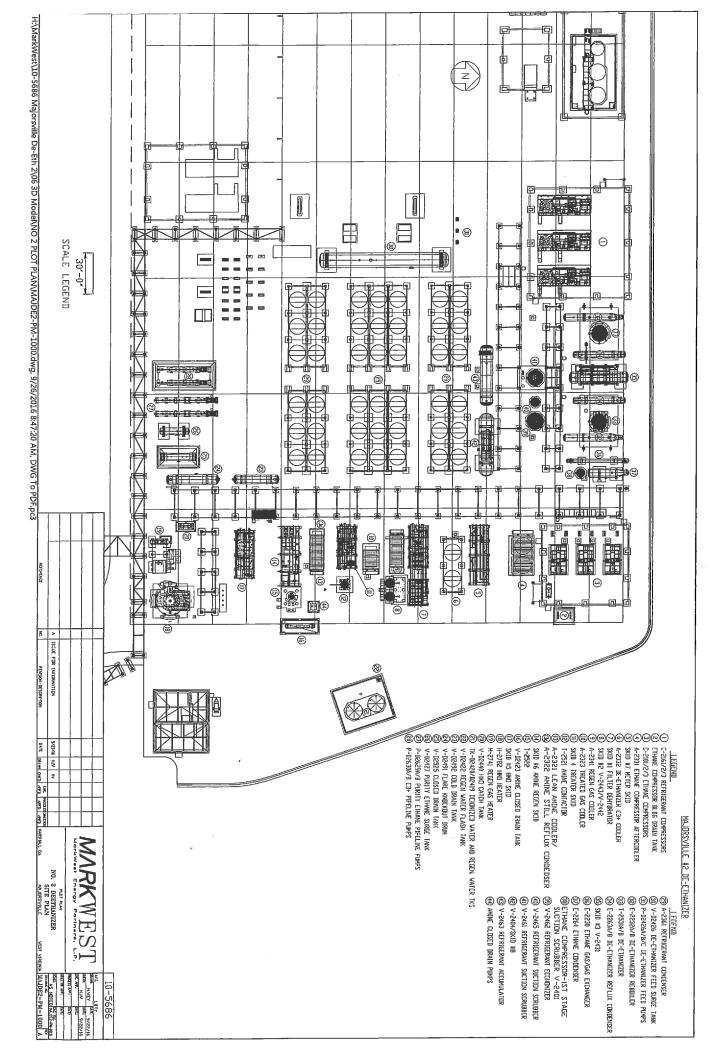
#### **Attachment E: Plot Plan**





## **Attachment F: Detailed Facility Flow Diagrams**





## **Attachment G: Process Description**

#### Attachment G: Process Description

MarkWest Liberty Midstream & Resources L.L.C. proposes to construct additional processing capability at the natural gas processing plant at the Majorsville site. The processing capability will consist of adding one natural gas processing plant (Majorsville VII) with a maximum capacity of 230 mmscf/day. With the additional unit the entire facility will have capacity for 1,500 mmscf/day. One stabilization unit will be installed to remove carryover methane and ethane from the natural gas liquids. The plant will be installed with appropriate electric compressor engines, and heaters as detailed in the equipment and emission summaries. With these changes the site will become a major source of primary pollutants. A review and update of fugitive emission sources has been performed, which resulted in an update of the counts and accounting for the LDAR program in place at the plant. All other emissions equipment will remain at the site and in operation as permitted.

The Majorsville Processing Plant is used as a gathering station for gas wells throughout southwest Pennsylvania and West Virginia. Upon entering the plant the gas goes through a mol sieve which is designed to remove liquids from the gas stream. Heaters are used to regenerate the mol sieve on a regular basis to remove the water and hydrocarbons. After the mol sieve the gas will be cooled through a cryogenic plant with mechanical refrigeration which serves to remove propane and heavier hydrocarbons in the gas stream. The natural gas liquids from the new plant will then pass through a stabilizer to remove any carryover methane and ethane in the liquid stream. The remaining gas stream (mostly methane and ethane) will pass through the deethanizers so that ethane can be separated and recovered from the gas stream. The ethane will then be transferred via pipeline to market. The remaining natural gas will pass through the existing compression engines or one of the electric driven engines prior to entering the downstream pipeline to market. Electric pumps will be located on the site to transfer the recovered liquids to another facility for disposal or further processing.

Attachment H: Material Safety Data Sheet (MSDS)



#### MATERIAL SAFETY DATA SHEET (MSDS) NATURAL GAS LIQUIDS (N.G.L.'s)

IDENTITY (As Used on Label and List)  Natural Gas Liquids (DOT ID No: 1075)		(Hazard Rating: Health-0/Fire-4/Reactvity-0) DOT Hazard Classification: Flammable Liquid, 3.1			
Manufacturer's Name MARKWEST		Emergency Pl	none Number 300) 730-8388 / C	HEMTREC (8	00) 424-9300
Address (Number, Street, City, State and ZIP code) 1515 Arapahoe Street		Telephone Nu (800) 730-83	mber for Information	n:	
Tower 2, Suite 700		Date Prepared October 1, 2004			
Denver, Colorado 80202-2126		Signature of P	reparer (optional)		
Section II – Hazardous Ingredients/Ident	tity Info	rmation			
		OSHA PEL	ACGIH TLV	Other Limits Recommended	% (optional)
Hazardous Components (Specific Chemical Identity; Common N	ante (S))	None	None		0 to 5%
Ethane (74-84-0) Propane (74-98-6)		110110	1000 ppm		20-70%
Normal Butane (106-97-8)			800 ppm		15-25%
Sobutane (75-28-5)		800 ppm			5-15%
Pentanes (109-66-0)	1000 ppm	600 ppm		5-25%	
		500 ppm			0-25%
Hexanes + (8006-61-9) Hydrogen Sulfide		10 ppm	20 ppm		0 to 0.055%
Section III - Physical/Chemical Characte Boiling Point -98° F to 90° F	eristics	Specific 0.50 to	Gravity (H <sub>2</sub> O = 1):		
Vapor Pressure (Reid): 30.0 to 90.0 psia at 100°F			Melting Point: Not determined		
/apor Density (AIR = 1):		Evaporation Rate (Butyl Acetate = 1): Not determined			
Solubility in Water: Negligible (below 0.1%)					
Appearance and Odor:  Gas and liquid. Clear to light brown color. Dist	inct hydr	ocarbon odor.		-	
Section IV - Fire and Explosion Hazard	Data				
Flash Point (Method Used):		Flammable Limits  Flammable Compressed Gas,  Flammable Liquid  LEL  1.0%  9.5%			UEL 9.5%
Extinguishing Media: Water spray, fog or foam. Dry chemical can be t	used for		iquid		

Special Fire Fighting Procedures: Stop flow of gas/liquid if possible, if not allow fire to burn. Do NOT direct water into liquid spill. Remain upwind of fire, if possible. Cool containers that are exposed to flame with water/for from the side, until well after fire is out. Firefighters should wear full bunker gear, including a positive pressure self-contained breathing apparatus.				
Unusual Fire and Explosion Hazards:  Extremely flammable may be ignited by heat, sparks or flame. When burning, there is danger of a violent explosion as liquid level in tank nears dryness. Product gives off heavier than air vapors that may travel considerable distances to a source of ignition a flash back. Extinguishment of fire before source of vapor is shut off can create an explosive mixture in the air. Liquid or vapor runoff to sewers may create a fire or explosion hazard.				
Section V -	Reactivity Dat	a		
Stability:	Unstable		Conditions to Avoid: Extremely flammable — avoid flames, spark, heat	
	Stable	X		
Incompatibility (I	Materials to Avoid): rs material (Chlo	rine,	Fluorine, etc.)	
Hazardous Decor Toxic vapor ar	nposition or Byprod ad gases (such as	ucts: <b>carb</b> e	on monoxide)	
Hazardous Polymerization	May Occur		Conditions to Avoid:	
	Will Not Occur	X		
Section VI -	· Health Hazar	d Da	nta	
Route(s) of Entry: Inhalation? Skin? Ingestion? Inhalation: Harmful or fatal if vapors inhaled; harmful or fatal if liquid is aspirated into lungs. Can cause dizziness, headache, nausea, unconsciousness or suffocation.				
Skin: Contact with <u>evaporating</u> liquid may cause burns similar to frostbite. Contact with <u>non-evaporating</u> liquid may cause skin irritation.				
Swallowing: Harmful or fatal if swallowed. Aspiration into the lungs can occur while vomiting after ingestion.				
Eyes: Contact irritation.	t with <u>evaporatin</u>	g liqu	id may cause burns similar to frostbite. Contact with vapors may cause eye	
Health Hazards (	(Acute or Chronic):			
Carcinogenicity:	None	NTP?	N/A IARC Monographs? N/A OSHA Registered N/A	
Signs and Symptoms of Exposure: N/A				
Medical Conditi	ons Generally Aggra	vated	by Exposure:	

Emergency and First Aid Procedures: Eyes: Flush eyes with tepid water for at least 15 minutes and get immediate medical attention. Skin: Remove contaminated clothing. Flush affected skin area with tepid water. Do NOT use hot water. Get immediate medical attention. Swallowed: Drink plenty of water, if possible. Do NOT induce vomiting and get immediate medical attention. Inhaled: Move victim to fresh air in uncontaminated area. Give artificial respiration if not breathing and give oxygen if breathing is difficult. Get immediate medical attention. Section VII - Precautions for Safe Handling and Use Steps to be taken in Case Material is Released or Spilled: Remove or shut off all sources of ignition. Stop leak if this can be done without risk for tank car or truck, isolate area for ½ mile radius and keep people out of area. Use water spray or fog to disperse vapors. For small spills, wear respirator and after all vapors have been released, take up liquid that has pooled with sand or noncombustible absorbent. For large spills, wear respirator and after all vapors have been released, dyke liquid for containment. Waste Disposal Method: Small amounts of vapor - controlled venting to outside air, ensuring dissipation of gas is below the LEL. Large amounts of NGL's - controlled burning in government permitted air pollution control facilities. Precautions to Be Taken in Handling and Storing: Keep away from ignition sources. Store in approved containers, preferably outdoors, or in a well-ventilated area. Ground and bond all product lines and equipment. Observe specific handling and safety procedures for Flammable Compressed Gas and Hydrogen Sulfide. Other Precautions: Ventilate areas, which may contain vapors before entering. Vapors may collect in low areas. Section VIII - Control Measures Respiratory Protection (Specify Type): Use with adequate ventilation and use hydrogen sulfide monitors. If ventilation is inadequate, use supplied air respirator.

Ventilation: Local Exhaust Special
Use explosion proof fans
Mechanical (General) Other

Protective Gloves Eye Protection
Vinton gloves Chemical goggles

Other Protective Clothing or Equipment: Impervious clothing and face shield

Work/Hygienic Practices

Avoid prolonged or continual exposure or contact. Control airborne concentrations below the exposure guidelines.

N/A - Not Applicable

N/D - Not Determined

~ -- Approximately

\* -- Based on LP (Gas)

#### **Attachment I: Emission Units Table**

#### Attachment I

#### **Emission Units Table**

# (includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

	that w	ill be part of this permit application	n review, re	gardiess of period	iting status,	I
Emission Unit ID <sup>1</sup>	Emission Point ID <sup>2</sup>	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type <sup>3</sup> and Date of Change	Control Device <sup>4</sup>
C-101	1E	Compressor Engine	2010	1340 hp	REMOVED	
C-102	2E	Compressor Engine	2010	2370 hp	Existing	
C-103	3E	Compressor Engine	2010	2370 hp	Existing	
C-104	4E	Compressor Engine	2010	2370 hp	Existing	
H-741	5E	Heater	2010	5.60 mmBtu/hr	Existing	
H-781	6E	Heater	2010	15.40 mmBtu/hr	Existing	
FUG-001	7E	Fugitive Leaks	2010/2014	NA	Modified	
H-2741	9E	Heater	2010	5.60 mmbtu/hr	Existing	
FL-991		Flare	2010	3.70 mmscf/hr	Existing	1C
H-3741	10E	Heater M III Regen Heater	2012/2013	7.69 mmbtu/hr	Existing	
H-4741	11E	Heater M IV Regen Heater	2012/2013	7.69 mmbtu/hr	Existing	
H-3781	12E	Heater M III HMO Heater	2012/2013	16.07 mmbtu/hr	Existing	
H-1782	13E	DeEthanizer I HMO Heater	2012/2013	119.20 mmbtu/hr	Existing	
H-2782	23E	DeEthanizer II HMO Heater	2017	119.20 mmbtu/hr	New	
H-1741	14E	DeEthanizer   Regen Heater	2012/2013	14.25 mmbtu/hr	Existing	
H-2741	24E	DeEthanizer II Regen Heater	2017	14.25 mmbtu/hr	New	
FL-3991		Flare DeEth I & II	2012/2013	2.92 mmscf/hr	Not Installed	2C
FL-1991		Flare DeEth, MIV, MVI, MVII	2012/2013	3.70 mmscf/hr	Existing	3C
H-5741	15E	Heater M V Regen Heater	2014	7.69 mmbtu/hr	Existing	
H-6741	16E	Heater M VI Regen Heater	2014	7.69 mmbtu/hr	Existing	
H-7741	17E	Heater M VII Regen Heater	2017	7.69 mmbtu/hr	New	
H-4781	18E	Heater M IV HMO Heater	2014	16.07 mmbtu/hr	Existing	
H-7781	19E	Heater M VII HMO Heater	2017	16.07 mmbtu/hr	New	
H-4782	20E	Stabilization Heater	2014	10.65 mmbtu/hr	Existing	
M1-G-1	21E	Majorsville 1 & 2 Emergency Gen	2012/2013	254 hp	Existing	
M3-G-2	22E	Majorsville 3 Emergency Gen	2014	145 hp	Existing	

M3-G-3	25E	Majorsville 3 MCC Emergency Gen	2014	145 hp	Existing	
M4-G-6	26E	Majorsville 4 MCC Emergency Gen	2014	145 hp	Existing	
M4-G-7	27E	Majorsville 4 Emergency Gen	2014	145 hp	Existing	
M7-G-8	28E	Majorsville 7 Emergency Gen	2017	145 hp	New	
M7-G-9	29E	Majorsville 7 MCC Emergency Gen	2017	145 hp	New	
MD1-G-4	30E	DeEthanizer 1 Control Room Emergency Gen	2012/2013	53 hp	Existing	
MD1-G-5	31E	DeEthanizer 1 Emergency Gen	2012/2013	32 hp	Existing	
MD2-G-10	32E	DeEthanizer 2 Control Room Emergency Gen	2017	53 hp	New	
MD2-G-11	33E	DeEthanizer 2 Emergency Gen	2017	32 hp	New	
MT-1	34E	Plant 1 Methanol Tank	2012/2013	520 Gal	Existing	
MT-2	35E	Plant 2 Methanol Tank	2012/2013	520 Gal	Existing	
MT-3	36E	Plant 3 Methanol Tank	2014	520 Gal	Existing	
MT-4	37E	Plant 4 Methanol Tank	2014	520 Gal	Existing	
MT-5	38E	Plant 5 Methanol Tank	2014	520 Gal	Existing	
MT-6	39E	Plant 6 Methanol Tank	2014	520 Gal	Existing	
MT-7	40E	Plant 7 Methanol Tank	2017	520 Gal	New	
GT-1	41E	Gasoline Dispensing Tank	2014	520 Gal	Existing	
DT-1	42E	Diesel Dispensing Tank	2014	520 Gal	Existing	
TK-1740	43E	Lube Oil Day Tank	2012/2013	520 Gal	Existing	
UOT-1	44E	Used Oil Tank	2012/2013	1,000 Gal	Existing	
TK-7411	45E	Lube Oil Tank	2012/2013	2,133 Gal	Existing .	
TK-7419	46E	Amine Tank	2012/2013		Existing	
TK-7421	47E	Amine Tank	2012/2013		Existing	
TK-4825	48E	Compressor Drain Tank	2014	2,326 Gal	Existing	
TK-4826	49E	Lube Oil Tank	2014	2,133 Gal	Existing	
TK-4824	50E	Closed Drain Tank	2014	4,200 Gal	Existing	
TK-4725	51E	Closed Drain Tank	2014	4,200 Gal	Existing	

<sup>&</sup>lt;sup>1</sup> For Emission Units (or Sources) use the following numbering system:1S, 2S, 3S,... or other appropriate designation.
<sup>2</sup> For Emission Points use the following numbering system:1E, 2E, 3E, ... or other appropriate designation.
<sup>3</sup> New, modification, removal
<sup>4</sup> For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

# Attachment J: Emission Points Data Summary Sheet

# Attachment J EMISSION POINTS DATA SUMMARY SHEET 1

	Emission Concentration 7 (ppmv or mg/m <sup>4</sup> )		Unk	Unk	Unk	40 ppm Unk Unk Unk	65 ppm Unk Unk Unk	Unk
	Est. Method Used <sup>6</sup>		vendor vendor vendor	vendor vendor vendor	vendor vendor vendor vendor	vendor AP-42 AP-42 AP-42	vendor AP-42 AP-42 AP-42	AP-42 AP-42 AP-42 AP-42
	Emission Form or Phase (At exit conditions, Solid, Liquid or	Gas/Vapor)	00 99 80 80 80 80 80 80 80 80 80 80 80 80 80	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	00 00 00 00 00 00 00 00 00 00 00 00 00	gas gas gas solid/vap	gas gas gas solid/vap	gas gas gas solid/vap
	Maximum Potential Controlled Emissions <sup>5</sup>	ton/yr	11.4 4.41 7.32 1.83	11.4 4.41 7.32 1.83	11.4 4.41 7.32 1.83	1.32 2.02 0.13 0.18	5.85 5.55 0.36 0.50	18.22 NA NA NA
	Maxi Pote Cont Emiss	lb/hr	2.61 1.0 1.67 0.42	2.61 1.0 1.67 0.42	2.61 1.0 1.67 0.42	0.30 0.46 0.03 0.04	1.33 1.27 0.08 0.11	Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z Z
	num ntial trolled ions <sup>4</sup>	ton/yr	11.4 63.0 14.4 9.15	11.4 63.0 14.4 9.15	11.4 63.0 14.4 9.15	1.32 2.02 0.13 0.18	5.85 5.55 0.36 0.50	NA 18.22 NA
	Maximum Potential Uncontrolled Emissions <sup>4</sup>	lb/hr	2.61 14.4 3.29 2.09	2.61 14.4 3.29 2.09	2.61 14.4 3.29 2.09	0.30 0.46 0.03 0.04	1.33 1.27 0.08 0.11	ZZZZ ZZZZ
Table 1: Emissions Data	All Regulated Pollutants - Chemical Name/CAS³ (Speciate VOCs & HAPS)		NOx 00-00-1 CO 630-08-0 VOC HCHO 5-00-0	NOx 00-00-1 CO 630-08-0 VOC HCHO 5-00-0	NOX 00-00-1 CO 630-08-0 VOC HCHO 5-00-0	NOx 00-00-1 CO 630-08-0 VOC PM <sub>10</sub> 00-01-3	NOx 00-00-1 CO 630-08-0 VOC PM <sub>10</sub> 00-01-3	NOx 00-00-1 CO 630-08-0 VOC PM10 00-01-3
Table	ne for Unit ical s only)	Max (hr/yr)	NA	Ą	A Z	NA	N A	NA A
	Vent Time for Emission Unit (chemical processes only)	Short Term <sup>2</sup>	AN	ĄZ	Y Y	N A	NA	NA
	Air Pollution Control Device (Must match Emission Units Table & Plot Plan)	Device Type						
	Air Po Control (Must Emissic Table	ID No.	¥ X	Ą Z	A N	Å,	A A	A Z
	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot Plan)	Source	Same	Same	Same	Same	Same	Ѕате
	Emission L Vented Through T Point (Must mat Emission U Table & P	D No.	Same	Same	Same	Same	Same	Ѕаше
	Emission Point Type		Vert St RainCp	Vert St RainCp	Vert St RainCp	Vert St RainCp	Vert St Rain Cp	Fugitives Area Source
	Emission Point ID No. (Must match Emission Units Table & Plot	Plan)	2E/C102	3E/C103	4E/C104	5E/H741	6E/H781	7E/FUG- 001

	Emission Point ID No. (Must match Emission Units Table & Plot	Plan)	9E/H2741	FL-991	10E/H3741	11E/H4741	12E/H3781	13E/H1782	14E/H1741
	Emission Point Type		Vert St RainCp	Vert St Flare Tip	Vert St RainCp				
	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot	ID No.	Same	Same	Same	Same	Same	Same	Same
	on Unit ted h This nt match n Units % Plot	Source	Same	Same	Same	Same	Same	Same	Same
	Air Pollution Control Device (Must match Emission Units Table & Plot Plan)	ID No.	₹ Z	Y Z	₹ Z	N A	A Z	¥	N A
	Air Pollution Control Device (Must match Emission Units Table & Plot Plan)	Device Type		Flare					
	Vent Time for Emission Unit (chemical processes only)	Short Term <sup>2</sup>	Ϋ́	Z Y	A N	Ą Z	Y Z	Z Z	Ž Z
Table	Time for sion Unit emical sses only)	Max (hr/yr)	Ą Z	N A	₹ Z	A Z	Z Y	N A	A A
Table 1: Emissions Data	All Regulated Pollutants - Chemical Name/CAS³ (Speciate VOCs & HAPS)		NOx 00-00-1 CO 630-08-0 VOC PM <sub>10</sub> 00-01-3	NOx 00-00-1 CO 630-08-0 VOC PM10 00-01-3					
	Maximum Potential Uncontrolled Emissions <sup>4</sup>	lb/hr	0.30 0.46 0.03 0.04	N N N N A A A A A	0.41 0.32 0.04 0.06	0.41 0.32 0.04 0.06	1.61 1.32 0.09 0.12	3.58 4.77 0.64 0.89	0.57 0.58 0.27 0.19
	num itial rolled ons <sup>4</sup>	ton/yr	1.32 2.02 0.13 0.18	0.18 0.15 0.01 0.01	1.80 1.38 0.18 0.25	1.80 1.38 0.18 0.25	7.04 5.80 0.38 0.52	15.66 20.88 2.82 3.89	2.50 2.56 1.19 0.81
	Maximum Potential Controlled Emissions <sup>5</sup>	lb/hr	0.30 0.46 0.03 0.04	A A A A	0.41 0.32 0.04 0.06	0.41 0.32 0.04 0.06	1.61 1.32 0.09 0.12	3.58 4.77 0.64 0.89	0.57 0.58 0.27 0.19
-	num ntial olise ons <sup>5</sup>	ton/yr	1.32 2.02 0.13 0.18	0.18 0.01 0.01	1.80 1.38 0.18 0.25	1.80 1.38 0.18 0.25	7.04 5.80 0.38 0.52	15.66 20.88 2.82 3.89	2.50 2.56 1.19 0.81
	Emission Form or Phase (At exit conditions, Solid, Liquid or	Gas/Vapor)	gas gas gas solid/vap	gas gas gas solid/vap	gas gas gas solid/vap	gas gas gas solid/vap	gas gas gas solid/vap	gas gas gas solid/vap	gas gas gas solid/vap
	Est. Method Used		vendor AP-42 AP-42 AP-42	AP-42 AP-42 AP-42 AP-42	vendor vendor AP-42 AP-42	vendor vendor AP-42 AP-42	vendor vendor AP-42 AP-42	vendor vendor AP-42 AP-42	vendor vendor AP-42 AP-42
	Emission Concentration (ppmv or mg/m <sup>4</sup> )		40 ppm Unk Unk Unk	, n	40 ppm 50 ppm Unk Unk	40 ppm 50 ppm Unk Unk	102 ppm 75 ppm Unk Unk	O K	30 ppm 50 ppm 15 ppm 15 ppm

_				1					
	Emission Concentration 7 (ppmv or mg/m <sup>4</sup> )			Cnk	40 ppm 50 ppm Unk Unk	40 ppm 50 ppm Unk Unk	40 ppm 50 ppm Unk Unk	102 ppm 75 ppm Unk Unk	102 ppm 75 ppm Unk Unk
	Est. Method Used			AP-42 AP-42 AP-42 AP-42	vendor vendor AP-42 AP-42	vendor vendor AP-42 AP-42	vendor vendor AP-42 AP-42	vendor vendor AP-42 AP-42	vendor vendor AP-42 AP-42
		Gasivapor)		gas gas gas solid/vap	gas gas gas solid/vap	gas gas gas solid/vap	gas gas gas solid/vap	gas gas gas solid/vap	gas gas gas solid/vap
ŀ	num ntial olled ions <sup>5</sup>	ton/yr		0.20 0.26 0.01 0.01	1.80 1.38 0.18 0.25	1.80 1.38 0.18 0.25	1.80 1.38 0.18 0.25	7.04 5.80 0.38 0.52	7.04 5.80 0.38 0.52
	Maximum Potential Controlled Emissions <sup>5</sup>	lb/hr		0.49 0.00 0.00	0.41 0.32 0.04 0.06	0.41 0.32 0.04 0.06	0.41 0.32 0.04 0.06	1.61 1.32 0.09 0.12	1.61 1.32 0.09 0.12
	tital olled ons 4	ton/yr		0.20 0.26 0.01 0.01	1.80 1.38 0.18 0.25	1.80 1.38 0.18 0.25	1.80 1.38 0.18 0.25	7.04 5.80 0.38 0.52	7.04 5.80 0.38 0.52
	Maximum Potential Uncontrolled Emissions <sup>4</sup>	lb/hr	LLED	0.49 0.00 0.00	0.41 0.32 0.04 0.06	0.41 0.32 0.04 0.06	0.41 0.32 0.04 0.06	1.61 1.32 0.09 0.12	1.61 1.32 0.09 0.12
Table 1: Emissions Data	All Regulated Pollutants - Chemical Name/CAS³ (Speciate VOCs & HAPS)		NEVER INSTALLED	NOx 00-00-1 CO 630-08-0 VOC PM10 00-01-3	NOx 00-00-1 CO 630-08-0 VOC PM <sub>10</sub> 00-01-3				
Table 1	e for Unit cal s only)	Max (hr/yr)		A A	NA	N A	A A	NA A	N A
	Vent Time for Emission Unit (chemical processes only)	Short Term <sup>2</sup>		₹ Z	A A	A A	₹ Z	N A	AN
	lution Device match n Units & Plot in)	Device Type		Flare					
	Air Pollution Control Device (Must match Emission Units Table & Plot Plan)	ID No.	II.	AA	A N	A A	A A	¥ Z	A N
	unit or This o	Source		Same	Same	Same	Same	Same	Same
	Emission Unit Vented Through This Point (Must match Emission Units Plan)	ID No.		Same	Same	Same	Ѕаше	Same	Same
	Emission Point Type <sup>1</sup>			Vert St Flare Tip	Vert St RainCp				
	Emission Point ID No. (Must match Emission Units Table & Plot	Plan)	FL-3991	FL-1991	15E/H5741	16E/H6741	17E/H7741	18E/H4781	19E/H7781

	Emission Concentration 7 (ppmv or mg/m <sup>4</sup> )		44 ppm 75 ppm Unk Unk	Cnk	Unk	Unk	30 ppm 50 ppm 15 ppm 15 ppm	Cuk	Unk
	Est. Method Used		vendor vendor AP-42 AP-42	vendor vendor vendor	vendor vendor vendor	vendor vendor AP-42 AP-42	vendor vendor AP-42 AP-42	vendor vendor AP-42 AP-42	vendor vendor AP-42 AP-42
	Emission Form or Phase (At exit conditions, Solid, Liquid or	Gasi vapor	gas gas gas solid/vap	gas gas gas solid/vap	gas gas gas solid/vap	gas gas gas solid/vap	gas gas gas solid/vap	gas gas gas solid/vap	gas gas gas solid/vap
	Maximum Potential Controlled Emissions <sup>5</sup>	ton/yr	2.74 3.84 0.25 0.35	0.28 0.42 0.14 0.01	0.18 0.04 0.00 0.06	15.66 20.88 2.82 3.89	2.50 2.56 1.19 0.81	0.18 0.04 0.00 0.06	0.04
	Maximum Potential Controllec Emissions	lb/hr	0.63 0.88 0.06 0.08	1.12 1.68 0.56 0.02	0.70 0.18 0.02 0.23	3.58 4.77 0.64 0.89	0.57 0.58 0.27 0.19	0.70 0.18 0.02 0.23	0.70 0.18 0.02 0.23
	um tial olled ons 4	ton/yr	2.74 3.84 0.25 0.35	0.28 0.42 0.14 0.01	0.18 0.04 0.00 0.06	15.66 20.88 2.82 3.89	2.50 2.56 1.19 0.81	0.04 0.00 0.00	0.18 0.00 0.00 0.06
	Maximum Potential Uncontrolled Emissions	lb/hr	0.63 0.88 0.06 0.08	1.12 1.68 0.56 0.02	0.70 0.18 0.02 0.23	3.58 4.77 0.64 0.89	0.57 0.58 0.27 0.19	0.70 0.18 0.02 0.23	0.70 0.18 0.02 0.23
Table 1: Emissions Data	All Regulated Pollutants - Chemical Name/CAS <sup>3</sup> (Speciate VOCs & HAPS)		NOX 00-00-1 CO 630-08-0 VOC PM <sub>10</sub> 00-01-3	NOX 00-00-1 CO 630-08-0 VOC PM <sub>10</sub> 00-01-3	NOx 00-00-1 CO 630-08-0 VOC PM <sub>10</sub> 00-01-3	NOX 00-00-1 CO 630-08-0 VOC PM10 00-01-3			
Table 1	e for Unit cal ; only)	Max (hr/yr)	₹ Z	A A	A A	₹ Z	AZ Z	Z Z	Ą Z
	Vent Time for Emission Unit (chemical processes only)	Short Term²	Ą Z	A X	A A	₹Z	Ą	₹ Z	AN A
	ution Device natch n Units k Plot n)	Device Type							
	Air Pollution Control Device (Must match Emission Units Table & Plot Plan)	ID No.	N A	NA A	AN	₹ Z	A A	Ą Z	Y Z
	Unit cd arch arch Plot Plot	onice	Same	Same	Same	Same	Same	Same	Same
	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot	ID No.	Same	Same	Same	Same	Same	Same	Same
	Emission Point Type	1	Vert St RainCp	Vert St RainCp	Vert St RainCp	Vert St RainCp	Vert St RainCp	Vert St RainCp	Vert St RainCp
	Emission Point ID No. (Must match Emission Units Table	Plan)	20E/H4782	21E/M1-G-	22E/M3-G-	23E/H2782	24E/H2741	25E/M3-G-	26E/M4-G-

	Emission Concentration 7 (ppmv or mg/m <sup>4</sup> )		Unk	Unk	Unk	, cuk	S S	Unk	Cuk
	Est. Method Used <sup>6</sup>		vendor vendor AP-42 AP-42						
	Emission Form or Phase (At exit conditions, Solid, Liquid or	Gas/vapor)	gas gas gas solid/vap						
	num ntial olled ions <sup>5</sup>	ton/yr	0.18 0.04 0.00	0.18 0.04 0.00 0.06	0.18 0.04 0.00 0.06	0.10 0.11 0.00	0.06 0.07 0.06 0.00	0.10 0.11 0.10 0.00	0.06 0.07 0.06 0.00
	Maximum Potential Controlled Emissions <sup>5</sup>	lb/hr	0.70 0.18 0.02 0.23	0.70 0.18 0.02 0.23	0.70 0.18 0.02 0.23	0.41 0.43 0.00	0.25 0.29 0.25 0.00	0.43 0.43 0.00	0.25 0.29 0.25 0.00
	rtial rolled ons	ton/yr	0.04	0.18 0.04 0.00 0.06	0.18 0.04 0.00 0.06	0.10	0.06 0.07 0.06 0.00	0.10 0.10 0.00	0.06 0.07 0.06 0.00
	Maximum Potential Uncontrolled Emissions	lb/hr	0.70 0.18 0.02 0.23	0.70 0.18 0.02 0.23	0.70 0.18 0.02 0.23	0.43 0.43 0.00	0.25 0.29 0.25 0.00	0.41 0.43 0.00	0.25 0.29 0.25 0.00
Table 1: Emissions Data	All Regulated Pollutants - Chemical Name/CAS <sup>3</sup> (Speciate VOCs & HAPS)		NOx 00-00-1 CO 630-08-0 VOC PM10 00-01-3						
Table 1	e for I Unit cal s only)	Max (hr/yr)	Ą Z	A A	₹ Z	A N	₹ Z	A Z	Ž Ž
	Vent Time for Emission Unit (chemical processes only)	Short Term²	₹ Z	A A	₹ Z	A Z	Ą Z	₹ Z	ď Z
	uttion Device natch n Units & Plot n)	Device Type							92
	Air Pollution Control Device (Must match Emission Units Table & Plot Plan)	ID No.	₹ Z	A A	A Z	¥ Z	¥2	¥ Z	A A
	unit bed This atch and the Control of the Control o	ource	Same	Ѕате	Same	Same	Same	Same	Same
	Emission Unit Vented Through This Point (Must match Emission Units Table & Plot	ID No.	Same						
	Emission Point Type	_	Vert St RainCp						
	Emission Point ID No. (Must match Emission Units Table	errou Plan)	27E/M4-G-	28E/M7-G-	29E/M7-G- 9	30E/MD1- G-4	31E/MD1- G-5	32E/MD2- G-10	33E/MD2- G-11

Attachment J EMISSION POINTS DATA SUMMARY SHEET 2

			Table 2: Rele	Release Parameter Data	er Data			
Emission	inner		Exit Gas		Emission Point Elevation (ft)	Elevation (ft)	UTM Coordinates (km)	nates (km)
Point ID No. (Must match Emission Units Table)	Diameter (ft.)	Temp.	Volumetric Flow <sup>1</sup> (acfm) at operating conditions	Velocity (fps)	Ground Level (Height above mean sea level)	Stack Height <sup>2</sup> (Release height of emissions above ground level)	Northing	Easting
25/0402	99 0	878	15.955	777	842	30	4423756.8	540867.3
20102	00.00	878	15,955	777	842	30	4423755.0	540871.3
2010/10	00.00	040	15.955	777	842	30	4423746.0	540877.2
4E/C104	0.00	010	3425	11.6	842	14.6	4423710.2	540796.0
0E/H/41	2.5	340	NA NA	NA N	842	18	NA	NA
75/5112,001	~3.0	6	10,666	25	842	130	4423770.4	540980.4
QE/H2741	5 5	550	3425	11.6	836	14.6	4423576	540773
1 - 001	3.0	1100	98,600	162	840	115	4423756	540977
10E/H3741	~20	550	4961	26.3	836	16	4423756	540977
445/11/2/44	22.0	250	4961	26.3	836	16	4423756	540977
1010111111	21 0	808	10.370	24.4	836	18	4423756	540977
10/61/32	200	000	26.242	6.6	836	144	4423756	540977
135/11/02	5. 0	550	7714	40.9	836	20	4423756	540977
1000	5 0	1100	113.322	196.3	836	199	4423756	540977
71-1881	3.0	4100	115.405	272.1	836	115	4423756	540977
4 EC/LISTA1	2.2	250	4961	26.3	836	16	4423100	540640
18E/H8741	~2.0	550	4961	26.3	836	16	4423100	540640
17E/H7741	~2.0	550	4961	26.3	836	16	4422990	540740
18E/H4781	23.0	596	10,370	24.4	836	18	4423100	540640
	25	3						

			Table 2: Release Parameter Data	ase Paramet	er Data			
Inner			Exit Gas		Emission Point Elevation (ft)	t Elevation (ft)	UTM Coordinates (km)	inates (km)
(ft.) Temp.	Ten (Å	.dr (-	Volumetric Flow <sup>1</sup> (acfm) at operating conditions	Velocity (fps)	Ground Level (Height above mean sea level)	Stack Height <sup>2</sup> (Release height of emissions above ground level)	Northing	Easting
~3.0 596	969		10,370	24.4	836	18	4422990	540740
~2.0 550	550		4961	26.3	836	18	4423100	540640
0.66 1,100	1,100		1,535	75	836	2	4423100	540640
0.66 778	778		665	31.4	836	80	4423100	540640
7.5 560	560		26,242	6.6	836	144	4423756	540977
2.0 550	550		7714	40.9	836	20	4423756	540977
0.66 778	778		665	31.4	836	80	4423100	540640
0.66 778	778		665	31.4	836	8	4423100	540640
0.66	778		665	31.4	836	&	4423100	540640
0.66 778	778		665	31.4	836	ω	4423100	540640
0.66 778	8//		665	31.4	836	ω	4423100	540640
0.66 778	778		243	11	836	ഗ	4423100	540640
0.66	778		147	7	836	ಬ	4423100	540640
0.66	778		243	11	836	Q	4423100	540640
0.66 778	778		147	7	836	5	4423100	540640

<sup>1</sup>Give at operating conditions. Include inerts. <sup>2</sup> Release height of emissions above ground level.

# Attachment K: Fugitive Emissions Data Summary Sheet

#### Attachment K

# FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

Piac	All other entiresients (e.g. which
	APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.)	Will there be haul road activities?
	☐ Yes         No
	☐ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.)	Will there be Storage Piles?
	☐ Yes ☐ No
	If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.)	Will there be Liquid Loading/Unloading Operations?
	☐ Yes ☐ No
	☐ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.)	Will there be emissions of air pollutants from Wastewater Treatment Evaporation?
ĺ	☐ Yes         No
	☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.)	Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)?
	☐ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.)	Will there be General Clean-up VOC Operations?
	☐ Yes         No
	☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.)	Will there be any other activities that generate fugitive emissions?
1	□ Ves No
	☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If Er	you answered "NO" to all of the items above, it is not necessary to complete the following table, "Fugitive missions Summary."

FUGITIVE EMISSIONS SUMMARY       All Regulated Pollutants       Uncontroll Incontroll Incontrol Incontroll Incontrolling		Maximim Potential	ļei.	Maximum Potential	otential	H <sub>Q</sub>
Chemical Name/CAS  NA  NA  Ation & NA  THC/HAP (generic)  NA	All Regulated Pollutants	Uncontrolled Emissions <sup>2</sup>	ions <sup>2</sup>	Controlled Emissions 3		Method
NA N	at		ton/yr	lb/hr	ton/yr	Osed
srations ent Evaporation & NA THC/HAP (generic) Emissions NA						
ent Evaporation & NA  THC/HAP (generic)  Emissions  NA	AN.					
oading Operations  Treatment Evaporation & NA  Leaks  THC/HAP (generic)  an-up VOC Emissions  NA	AN					
Treatment Evaporation & NA  Leaks  THC/HAP (generic)  an-up VOC Emissions  NA						
THC/HAP (generic) VOC Emissions	ంర					
		Does not apply 38.	38.38/0.29	Does not apply	38.38/0.29	ЕРА
Other	AN					

<sup>1</sup> List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS<sub>2</sub>, VOCs, H<sub>2</sub>S, Inorganics, Lead, Organics, O<sub>3</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, SO<sub>3</sub>, etc. DO NOT LIST CO<sub>2</sub>, H<sub>2</sub>, H<sub>2</sub>O, N<sub>2</sub>, O<sub>2</sub>, and Noble Gases.

<sup>3</sup> Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb <sup>2</sup> Give rate with no control equipment operating. VOC/20 minute batch).

<sup>4</sup> Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify). VOC/20 minute batch).

# Attachment L: Emissions Unit Data Sheets

## General: Heaters

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on Equipment List Form): H-7741
Name or type and model of proposed affected source:
Heatec Process Heater, 7.69 MMBtu/hour (5.79 mmbtu/hr output)
If a wardiffication is to
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
Name(s) and maximum amount of proposed process material(s) charged per hour:
Natural gas, 7.69 MMBtu/hour
4. Name(s) and maximum amount of proposed material(s) produced per hour:
Natural gas, 7.69 MMBtu/hour
5. Give chemical reactions, if applicable, that will be involved in the generation of air
Fuel combustion
Live the state of

<sup>\*</sup> The identification number which appears here must correspond to the air pollution control device identification number appearing on the List Form.

6. Combustion	Data (if app	licable):			
(a) Type and an	nount in app	ropriate units of f	uel(s) to be bur	ned:	
Natural gas, 66.0					
(b) Chemical a sulfur and a	nalysis of p sh:	roposed fuel(s),	excluding coa	I, including r	maximum percent
Sulfur and ash a	re insignific	ant.			
(c) Theoretical	combustion	air requirement (	ACF/unit of fue	l):	
Unk	@		°F and		psia.
(d) Percent exc		nk			
(e) Type and BTU/hr of burners and all other firing equipment planned to be used:					
Helical coil heat					
(f) If coal is pr the coal as	oposed as a it will be fire	a source of fuel, d:	identify supplie	er and seams	and give sizing of
NA					
(g) Proposed t	maximum de	sign heat input:			× 10 <sup>6</sup> BTU/hr.
7. Projected	perating scl	nedule:		1	
Hours/Day	24	Days/Week	7	Weeks/Yea	r 52

psia 	14.5	°F and		~60	@
grains/ACI		lb/hr	0.41	O <sub>X</sub>	l.
grains/AC		lb/hr	0.0045	O <sub>2</sub>	).
grains/AC		lb/hr	0.32	CO	
grains/AC		lb/hr	0.06	PM <sub>10</sub>	ł.
grains/AC		lb/hr	NA	Hydrocarbons	<b>)</b> .
grains/AC		lb/hr	0.041	/OCs	:
grains/AC		lb/hr	NA	Pb	g.
				Specify other(s)	٦.
grains/A0		lb/hr		81	
grains/A0		lb/hr			
grains/A		lb/hr			
grains/A		lb/hr			

<sup>(1)</sup> An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

<sup>(2)</sup> Complete the Emission Points Data Sheet.

	C. Lasting
Proposed Monitoring, Recordkeeping, R     Please propose monitoring, recordkeepir     compliance with the proposed operating pa     demonstrate compliance with the proposed     MONITORING     Operating hours	arameters. Please propose testing in order to
REPORTING As required	TESTING NA
8.	
PROPOSED TO BE MONITORED IN ORDER TO DEN	HE PROCESS PARAMETERS AND RANGES THAT ARE MONSTRATE COMPLIANCE WITH THE OPERATION OF JTION CONTROL DEVICE.
RECORDKEEPING. PLEASE DESCRIBE THE PI	ROPOSED RECORDKEEPING THAT WILL ACCOME AND
REPORTING. PLEASE DESCRIBE THE PR	ROPOSED FREQUENCY OF REPORTING OF THE
TESTING. PLEASE DESCRIBE ANY PROPERTY.	OSED EMISSIONS TESTING FOR THIS PROCESS
10. Describe all operating ranges and material to maintain warranty  To be determined upon delivery.	aintenance procedures required by Manufacturer
10 be determined upon derivery.	

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

xchangers, and quarries.  dentification Number (as assigned on <i>Equipment List Form</i> ): H-7781
Name or type and model of proposed affected source:
Heatec Process Heater, 16.07 MMBtu/hour (11.2 mmbtu/hr output)
<ol> <li>On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.</li> </ol>
3. Name(s) and maximum amount of proposed process material(s) charged per hour:  Output  Description:
Natural gas, 16.07 MMBtu/hour
4. Name(s) and maximum amount of proposed material(s) produced per hour:
Natural gas, 16.07 MMBtu/hour
5. Give chemical reactions, if applicable, that will be involved in the generation of a
Fuel combustion
* The identification number which appears here must correspond to the air pollution cont

<sup>\*</sup> The identification number which appears here must correspond to the air pollution control device identification number appearing on the List Form.

Combustion Data (if applicable):  (a) Type and amount in appropriate units of fuel(s) to be burned:  Natural gas, 138.0 MMSCF/year  (b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:  (c) Theoretical combustion air requirement (ACF/unit of fuel):  Unk @ °F and psia.  (d) Percent excess air: Unk  (e) Type and BTU/hr of burners and all other firing equipment planned to be used:  Helical coil heater, 16.07 mmBtu/hr  (f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:  NA  (g) Proposed maximum design heat input: × 10° BTU/hr.  7. Projected operating schedule: Hours/Day 24 Days/Week 7 Weeks/Year 52						
Natural gas, 138.0 MMSCF/year  (b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:  Sulfur and ash are insignificant.  (c) Theoretical combustion air requirement (ACF/unit of fuel):  Unk	. Combustion	Data (if appli	cable):	al(a) ta ba buri	ned:	
(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:  (c) Theoretical combustion air requirement (ACF/unit of fuel):  Unk	(a) Type and ar	mount in appro	opriate units of fue	el(s) to be buil	neu.	1
Sulfur and ash are insignificant.  (c) Theoretical combustion air requirement (ACF/unit of fuel):  Unk	Natural gas, 138	3.0 MMSCF/y	vear	•		
(c) Theoretical combustion air requirement (ACF/unit of fuel):  Unk	(b) Chemical a sulfur and a	inalysis of pr	oposed fuel(s), e	excluding coal	l, including max	imum percent
Unk @ °F and psia.  (d) Percent excess air: Unk  (e) Type and BTU/hr of burners and all other firing equipment planned to be used:  Helical coil heater, 16.07 mmBtu/hr  (f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:  NA  (g) Proposed maximum design heat input: × 10 <sup>6</sup> BTU/hr.  7. Projected operating schedule:	Sulfur and ash a	are insignifica	ant.			
Unk @ °F and psia.  (d) Percent excess air: Unk  (e) Type and BTU/hr of burners and all other firing equipment planned to be used:  Helical coil heater, 16.07 mmBtu/hr  (f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:  NA  (g) Proposed maximum design heat input: × 10 <sup>6</sup> BTU/hr.  7. Projected operating schedule:				05/ 11.66.cd	N.	
Unk @ Pand  (d) Percent excess air: Unk  (e) Type and BTU/hr of burners and all other firing equipment planned to be used:  Helical coil heater, 16.07 mmBtu/hr  (f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:  NA  (g) Proposed maximum design heat input: × 10 <sup>6</sup> BTU/hr.  7. Projected operating schedule:	(c) Theoretical	combustion a	air requirement (A	CF/unit of fuel	);	
(e) Type and BTU/hr of burners and all other firing equipment planned to be used:  Helical coil heater, 16.07 mmBtu/hr  (f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:  NA  (g) Proposed maximum design heat input: × 10 <sup>6</sup> BTU/hr.  7. Projected operating schedule:	Unk	@		°F and		psia. 
(e) Type and BTU/hr of burners and all other firing equipment planned to be used:  Helical coil heater, 16.07 mmBtu/hr  (f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:  NA  (g) Proposed maximum design heat input: × 10 <sup>6</sup> BTU/hr.  7. Projected operating schedule:	(d) Percent ex	cess air: Ur	nk			
Helical coil heater, 16.07 mmBtu/hr  (f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:  NA  (g) Proposed maximum design heat input: × 10 <sup>6</sup> BTU/hr.  7. Projected operating schedule:			ners and all other	firing equipme	ent planned to be	used:
the coal as it will be fired:  NA  (g) Proposed maximum design heat input: × 10 <sup>6</sup> BTU/hr.  7. Projected operating schedule: 7 Weeks/Year 52	Helical coil hea	iter, 16.07 m	mBtu/hr			
(g) Proposed maximum design heat input: × 10 <sup>6</sup> BTU/hr.  7. Projected operating schedule:  7. Weeks/Year 52	(f) If coal is p the coal as	proposed as a	source of fuel, in	dentify supplie	er and seams an	d give sizing o
(g) Proposed maximum design heat input.  7. Projected operating schedule:  7. Weeks/Year 52	NA					
7. Projected operating schedule:  7. Weeks/Year 52	(g) Proposed	maximum de	sign heat input:			× 10 <sup>6</sup> BTU/hr.
Weeks/Year 52						
				7	Weeks/Year	52

@	~60	°F and		14.5 psia
	NO <sub>X</sub>	1.61	lb/hr	grains/ACF
).	SO <sub>2</sub>	0.0095	lb/hr	grains/ACF
<b>.</b>	CO	1.32	lb/hr	grains/ACF
۱.	PM <sub>10</sub>	0.12	lb/hr	grains/ACF
e.	Hydrocarbons	NA	lb/hr	grains/ACF
	VOCs	0.087	lb/hr	grains/ACF
g.	Pb	NA	lb/hr	grains/ACI
h.	Specify other(s)		1	
			lb/hr	grains/AC

<sup>(1)</sup> An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

<sup>(2)</sup> Complete the Emission Points Data Sheet.

Proposed Monitoring, Recordkeeping, R     Please propose monitoring, recordkeeping     compliance with the proposed operating pademonstrate compliance with the proposed     MONITORING     Operating hours	arameters. Please propose testing in order to
DEDODTING	TESTING
REPORTING As required	NA
7.5 Toguliou	
197	
MONITORING. PLEASE LIST AND DESCRIBE THE PROPOSED TO BE MONITORED IN ORDER TO DEM THIS PROCESS EQUIPMENT OPERATION/AIR POLLU	I E PROCESS PARAMETERS AND RANGES THAT ARE ONSTRATE COMPLIANCE WITH THE OPERATION OF TION CONTROL DEVICE.
RECORDIFERING. PLEASE DESCRIBE THE PR	OPOSED RECORDKEEPING THAT WILL ACCOMPANY
THE MONITORING.	
	OPOSED FREQUENCY OF REPORTING OF THE
RECORDKEEPING.	OFF EMISSIONS TESTING FOR THIS PROCESS
TESTING. PLEASE DESCRIBE ANY PROPORTION CONTROL DEVICE.	SED EMISSIONS TESTING FOR THIS PROCESS
10. Describe all operating ranges and mai	ntenance procedures required by Manufacturer
to maintain warranty	
To be determined upon delivery.	^

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

xchangers, and quarries.  dentification Number (as assigned on <i>Equipment List Form</i> ): H-2782
Name or type and model of proposed affected source:
Optimized Process Furnaces Process Heater, 119.20 MMBtu/hour ( 107.28 mmbtu/hr output)
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour:
Natural gas, 119.20 MMBtu/hour
4. Name(s) and maximum amount of proposed material(s) produced per hour:
Natural gas, 119.20 MMBtu/hour
5. Give chemical reactions, if applicable, that will be involved in the generation of a
Fuel combustion
Learning the support here must correspond to the air pollution cont

\* The identification number which appears here must correspond to the air pollution control device identification number appearing on the List Form.

. Combustion (a) Type and ar	Data (if appl nount in appr	icable): opriate units of fue	el(s) to be burn	ned:	4
Natural gas, 1,02					
(b) Chemical a sulfur and a	nalysis of pi sh:	roposed fuel(s), e	xcluding coal	, including ma	ximum percent
Sulfur and ash a	are insignific	ant.			
(c) Theoretical	combustion	air requirement (A	CF/unit of fuel	):	
Unk	@		°F and	5	psia. 
(d) Percent ex	cess air: U	nk			
Helical coil hea		ners and all other f mmBtu/hr			
(f) If coal is p the coal as	proposed as a	a source of fuel, ided:	lentify supplie	r and seams a	nd give sizing of
NA					
(g) Proposed	maximum de	esign heat input:	10	).65	× 10 <sup>6</sup> BTU/hr.
7. Projected	operating sc	hedule:		1	<i>F</i> 0
Hours/Day	24	Days/Week	7	Weeks/Year	

@	devices were used: ~60	°F and		14.5 psia
 a.	NO <sub>X</sub>	3.576	lb/hr	grains/ACF
٥.	SO <sub>2</sub>	0.07	lb/hr	grains/ACF
<b>c</b> .	со	4.768	lb/hr	grains/ACF
d.	PM <sub>10</sub>	0.888	lb/hr	grains/ACF
e.	Hydrocarbons	. NA	lb/hr	grains/ACF
f.	VOCs	0.643	lb/hr	grains/ACF
g.	Pb	NA	lb/hr	grains/AC
h.	Specify other(s)			
	*		lb/hr	grains/AC
			lb/hr	grains/AC
			lb/hr	grains/AC
			lb/hr	grains/AC

<sup>(1)</sup> An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

<sup>(2)</sup> Complete the Emission Points Data Sheet.

Proposed Monitoring, Recordkeeping, R     Please propose monitoring, recordkeeping compliance with the proposed operating proposed demonstrate compliance with the proposed MONITORING Operating hours	arameters. Please propose testing in order to
REPORTING As required	TESTING NA
* #	
PROPOSED TO BE MONITORED IN ORDER TO DEN THIS PROCESS EQUIPMENT OPERATION/AIR POLLI RECORDKEEPING. PLEASE DESCRIBE THE PI	ROPOSED RECORDKEEPING THAT WILL ACCOMPANT
REPORTING. PLEASE DESCRIBE THE PERIOD OF THE	OSED EMISSIONS TESTING FOR THIS PROCESS
10. Describe all operating ranges and material to maintain warranty  To be determined upon delivery.	aintenance procedures required by Manufacturer

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on Equipment List Form): H-2741
1. Name or type and model of proposed affected source:
Tulsa Heaters Process Heater, 14.25 MMBtu/hour ( 12.83 mmbtu/hr output)
<ol> <li>On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.</li> </ol>
3. Name(s) and maximum amount of proposed process material(s) charged per hour:
Natural gas, 14.25 MMBtu/hour
*
4. Name(s) and maximum amount of proposed material(s) produced per hour:
3e)
Natural gas, 14.25 MMBtu/hour
*
5. Give chemical reactions, if applicable, that will be involved in the generation of air
Fuel combustion
<ul> <li>The identification number which appears here must correspond to the air pollution control device identification number appearing on the List Form.</li> </ul>

			1
Combustion Data (if applicable):	) to be burn	and:	
(a) Type and amount in appropriate units of fuel(s	s) to be buil	iea.	S#U
Natural gas, 122 MMSCF/year			
(b) Chemical analysis of proposed fuel(s), exc sulfur and ash:	luding coal	, including ma	ximum percent
Sulfur and ash are insignificant.			
(c) Theoretical combustion air requirement (ACF	/unit of fuel	):	
Unk @	°F and		psia.
(d) Percent excess air: Unk			
(e) Type and BTU/hr of burners and all other firit	ng equipme	nt planned to b	e used:
Helical coil heater, 14.25 mmBtu/hr			
(f) If coal is proposed as a source of fuel, identhe coal as it will be fired:	ntify supplie	r and seams a	nd give sizing <b>o</b> f
NIA			
NA			
(g) Proposed maximum design heat input:	10	).65	× 10 <sup>6</sup> BTU/hr.
7. Projected operating schedule:		1	52

@	~60	°F and		14.5	psia 
 t.	NO <sub>X</sub>	0.57	lb/hr		grains/ACF
<b>)</b> .	SO <sub>2</sub>	0.008	lb/hr		grains/ACF
<b>;</b> .	CO	0.584	lb/hr		grains/ACF
d.	PM <sub>10</sub>	0.185	lb/hr		grains/ACF
∋.	Hydrocarbons	NA	lb/hr		grains/ACF
f.	VOCs	0.271	lb/hr		grains/ACF
g.	Pb	NA	lb/hr		grains/ACI
h.	Specify other(s)		1		
			lb/hr		grains/AC
			lb/hr		grains/AC
			lb/hr	<b>K</b> 2	grains/AC
			lb/hr		grains/AC

<sup>(1)</sup> An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

<sup>(2)</sup> Complete the Emission Points Data Sheet.

	Carry and Teating
compliance with the proposed operating pa	rameters. Please propose testing in order to
	TEOTING
REPORTING As required	TESTING NA
/ to rodanos	
LEGGER TO BE MONITORED IN ORDER TO DEN	IE PROCESS PARAMETERS AND RANGES THAT ARE IONSTRATE COMPLIANCE WITH THE OPERATION OF
THIS PROCESS EQUIPMENT OPERATION/AIR POLLU	ROPOSED RECORDKEEPING THAT WILL ACCOMPANY
THE MONITORING	OPOSED FREQUENCY OF REPORTING OF THE
PECOPONEEDING	
TESTING. PLEASE DESCRIBE ANY PROPO	SED EMISSIONS TESTING FOR THIS PROCESS
10. Describe all operating ranges and ma	intenance procedures required by Manufacturer
to maintain warranty To be determined upon delivery.	

## General: Generators

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): M3-G-2, M3-G-3, M4-G-6,

Name or type and model of proposed affected source:
 Cummins 60 DSFAD Diesel Generator
 On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
 Name(s) and maximum amount of proposed process material(s) charged per hour:
 Diesel, 3.85 MMBtu/hour
 Name(s) and maximum amount of proposed material(s) produced per hour:

Diesel, 3.85 MMBtu/hour

Give chemical reactions, if applicable, that will be involved in the generation of air pollutants:

Fuel combustion

\* The identification number which appears here must correspond to the air pollution control device identification number appearing on the List Form.

6. Combustic	on Data (if appl amount in appl	icable): opriate units of fu	el(s) to be burn	ed:	
Diesel, 14,000	gal/year		*		
(b) Chemical sulfur and	analysis of pash:	roposed fuel(s),	excluding coal,	including ma	ximum percent
Sulfur and ash	are insignific	ant.			
(c) Theoretic	al combustion	air requirement (A	CF/unit of fuel)	•	
Unk	@		°F and		psia. 
(d) Percent e	xcess air: U	nk			
		ners and all other	firing equipmer	nt planned to be	e used:
NA					
(f) If coal is the coal a	proposed as a as it will be fire	a source of fuel, i d:	dentify supplier	and seams a	nd give sizing of
NA					
(g) Propose	d maximum de	esign heat input:	3.8	35	× 10 <sup>6</sup> BTU/hr.
	d operating scl				ži.
Hours/Day	24	Days/Week	7	Weeks/Year	3

@	~60	°F and	l	14.5	psia 
l.	NO <sub>X</sub>	0.70	lb/hr		grains/ACF
).	SO <sub>2</sub>	0.58	lb/hr		grains/ACF
· ·	СО	0.18	lb/hr		grains/ACF
<b>i</b> .	PM <sub>10</sub>	0.0.23	lb/hr		grains/ACF
Э.	Hydrocarbons	NA	lb/hr		grains/ACF
	VOCs	0.02	lb/hr		grains/ACI
<b>g</b> .	Pb	NA	lb/hr		grains/ACI
า.	Specify other(s)		1		
			lb/hr		grains/AC
			lb/hr		grains/AC
			lb/hr		grains/AC
			lb/hr		grains/AC

<sup>(1)</sup> An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

<sup>(2)</sup> Complete the Emission Points Data Sheet.

Proposed Monitoring, Recordkeeping, R     Please propose monitoring, recordkeepir     compliance with the proposed operating pa     demonstrate compliance with the proposed     MONITORING     Operating hours	arameters. Please propose testing in order to
	~
- TOOPTING	TESTING
REPORTING As required	NA
, to roganies	
TO BE MONITORED IN ORDER TO DEN	HE PROCESS PARAMETERS AND RANGES THAT ARE MONSTRATE COMPLIANCE WITH THE OPERATION OF UTION CONTROL DEVICE.
THIS PROCESS EQUIPMENT OPERATION/AIR POLLI	ROPOSED RECORDKEEPING THAT WILL ACCOMPANY
- I A CONTORNIC	
	ROPOSED FREQUENCY OF REPORTING OF THE
RECORDKEEPING.  TESTING. PLEASE DESCRIBE ANY PROPERTY.	OSED EMISSIONS TESTING FOR THIS PROCESS
EQUIPMENT/AIR POLLUTION CONTROL DEVICE.	aintenance procedures required by Manufacturer
10. Describe all operating ranges and ma	MILITARIO PROGRAMA PARA
to maintain warranty To be determined upon delivery.	
1000	
,	

### Attachment L EMISSIONS UNIT DATA SHEET GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on Equipment List Form): M1-G-1
Name or type and model of proposed affected source:
Generac Natural Gas Generator
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
3. Name(s) and maximum amount of proposed process material(s) charged per hour:
Natural gas, 2.10 MMBtu/hour
4. Name(s) and maximum amount of proposed material(s) produced per hour:
Natural gas, 2.10 MMBtu/hour
5. Give chemical reactions, if applicable, that will be involved in the generation of pollutants:
Fuel combustion
and to the cir pollution cot

<sup>\*</sup> The identification number which appears here must correspond to the air pollution control device identification number appearing on the List Form.

6. Co	ombustion Data (if a	applicable): appropriate units of fu	uel(s) to be burn	ned:	
	l gas, 1.03 MMSC				
(b) C	hemical analysis oulfur and ash:	of proposed fuel(s),	excluding coal	, including max	kimum percent
Sulfur	and ash are insigr	nificant.			
(c) T	heoretical combust	ion air requirement (A	ACF/unit of fuel)	):	
1	Unk @		°F and		psia.
	Percent excess air:	Unk			
(e) T	ype and BTU/hr of	burners and all other	firing equipmen	nt planned to be	used:
(f) !	f coal is proposed the coal as it will be	as a source of fuel, fired:	identify supplie	r and seams ar	nd give sizing of
NA		è			
:					
(=)	Proposed maximum	n design heat input:	2.	10	× 10 <sup>6</sup> BTU/hr.
1					
7. Hours/l	Projected operating  Day 24	Days/Week	7	Weeks/Year	3

@	~60	°F and		14.5 psia
 a.	NO <sub>X</sub>	1.12	lb/hr	grains/ACF
).	SO <sub>2</sub>	0.001	lb/hr	grains/ACF
<b>)</b> .	CO	1.68	lb/hr	grains/ACF
d.	PM <sub>10</sub>	0.021	lb/hr	grains/ACF
Э.	Hydrocarbons	NA	lb/hr	grains/ACF
f.	VOCs	0.56	lb/hr	grains/ACI
g.	Pb	NA	lb/hr	grains/AC
h.	Specify other(s)			
			lb/hr	grains/AC

NOTE:

<sup>(1)</sup> An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

<sup>(2)</sup> Complete the Emission Points Data Sheet.

Proposed Monitoring, Recordkeeping, Recordkeep	arameters. Please propose testing in order to
REPORTING As required	TESTING NA
PROPOSED TO BE MONITORED IN ORDER TO DEN THIS PROCESS EQUIPMENT OPERATION/AIR POLLU RECORDKEEPING. PLEASE DESCRIBE THE PROPERTY OF THE MONITORING	ROPOSED RECORDKEEPING THAT WILL ACCOMPANT
RECORDKEEPING.  TESTING. PLEASE DESCRIBE ANY PROPORTION OF THE PRO	ROPOSED FREQUENCY OF REPORTING OF THE DSED EMISSIONS TESTING FOR THIS PROCESS aintenance procedures required by Manufacturer
<ul><li>10. Describe all operating ranges and material to maintain warranty</li><li>To be determined upon delivery.</li></ul>	minerialise processing a square

### Attachment L EMISSIONS UNIT DATA SHEET GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification	Number	(as	assigned	on	Equipment :	List	Form)	1

MD1-G-4 & MD2-G-10

Identification Number (as assigned on Equipment)
Name or type and model of proposed affected source:
Generac MMG45
8
this effected course. If a modification is to
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.
Name(s) and maximum amount of proposed process material(s) charged per hour:
Diesel, 0.41 MMBtu/hour
Name(s) and maximum amount of proposed material(s) produced per hour:
4. Hamo(o) and memory
Diesel, 0.41 MMBtu/hour
5. Give chemical reactions, if applicable, that will be involved in the generation of air
5. Give chemical reactions, if applicable, that will be involved in the generalization pollutants:
Fuel combustion
here must correspond to the air pollution control

\* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

. Combustion	Data (if applicable):			1.	
(a) Type and a	mount in appropriate ι	units of fuel(s	to be burn	ea:	
Diesel, 1,500 ga	ıl/year				
	analysis of proposed	fuel(e) evel	uding coal	including max	imum percent
(b) Chemical a sulfur and a	analysis of proposed ash:	ruei(s), exci	dding oodi,		
Sulfur and ash	are insignificant.			ē	
(c) Theoretica	l combustion air requi	rement (ACF	unit of fuel	):	
Unk	@		°F and		psia. 
(d) Percent ex	cess air: Unk				
(e) Type and	BTU/hr of burners and	d all other firing	g equipme	nt planned to be	used:
( )					
					t to also a
(f) If coal is	proposed as a source s it will be fired:	e of fuel, iden	tify supplie	r and seams ar	d give sizing (
ine cours					
NA					
					4.06 DTI 1/1-
(g) Proposed	d maximum design he	at input:	0.	41	× 10 <sup>6</sup> BTU/hr.
7. Projected	d operating schedule:			1	•
Hours/Day	24 Days/V	Week	7	Weeks/Year	3
1					

psia 	14.5	°F and		evices were used: ~60	@
grains/ACF		lb/hr	0.41	NO <sub>X</sub>	ı. 1
grains/ACF		lb/hr	0.11	SO <sub>2</sub>	). ;
grains/ACF		lb/hr	0.43	СО	- ;, '
grains/ACF		lb/hr	0.00	PM <sub>10</sub>	- d.
grains/ACF		lb/hr	NA	Hydrocarbons	- e.
grains/ACF		lb/hr	0.41	VOCs	f.
grains/ACI		lb/hr	NA	Pb	g.
	 I			Specify other(s)	h.
grains/AC		lb/hr			
grains/AC		lb/hr			
grains/AC		lb/hr			
grains/AC		lb/hr			

NOTE:

<sup>(1)</sup> An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

<sup>(2)</sup> Complete the Emission Points Data Sheet.

	T. T. C. C.
Proposed Monitoring, Recordkeeping, R     Please propose monitoring, recordkeeping compliance with the proposed operating pademonstrate compliance with the proposed MONITORING     Operating hours	arameters. Please propose testing in order to
REPORTING	TESTING
As required	NA
PROPOSED TO BE MONITORED IN ORDER TO DEN THIS PROCESS EQUIPMENT OPERATION/AIR POLLU RECORDKEEPING. PLEASE DESCRIBE THE PI THE MONITORING. REPORTING. PLEASE DESCRIBE THE PE	ROPOSED RECORDINE THAT WILL ACCOMPANY ROPOSED FREQUENCY OF REPORTING OF THE
TESTING. PLEASE DESCRIBE ANY PROPORTION OF THE P	OSED EMISSIONS TESTING FOR THIS PROCESS aintenance procedures required by Manufacturer

## Attachment L **EMISSIONS UNIT DATA SHEET GENERAL**

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

_				_
Identification Number	(as	assigned on	Equipment List	Form):

MD1-G-5 & MD2-G-11

Identification Number (as assigned on Equipment List Form).
Name or type and model of proposed affected source:
1. Name of type and model of proposes and
Generac MMG25
2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to
2. On a separate sheet(s), furnish a sketch(es) of this affected search.  be made to this source, clearly indicated the change(s). Provide a narrative description of be made to this source, clearly indicated the production of air pollutants.
be made to this source, clearly indicated the change(s). The state of air pollutants all features of the affected source which may affect the production of air pollutants.
all features of the affected source which may direct the production of the affected source which may direct the production of the affected source which may direct the production of the affected source which may direct the production of the affected source which may direct the production of the affected source which may direct the production of the affected source which may direct the production of the affected source which may direct the production of the affected source which may direct the production of the affected source which may direct the production of the affected source which may direct the production of the affected source which may direct the production of the affected source which may direct the production of the affected source which may direct the production of the affected source which may direct the production of the affected source which may direct the production of the affected source which may direct the production of the affected source which may direct the affected source wh
Name(s) and maximum amount of proposed process material(s) charged per hour:
Diesel, 0.25 MMBtu/hour
Dicaci, 6.26 min.
4. Name(s) and maximum amount of proposed material(s) produced per hour:
4. Name(s) and maximum amount of proposed material (-)
<u> </u>
The state of the Manufacture
Diesel, 0.25 MMBtu/hour
5. Give chemical reactions, if applicable, that will be involved in the generation of air
5. Give chemical reactions, if applicable, that will be inverse.
pollutants:
AT
To the surface of the
Fuel combustion
Learn which appears here must correspond to the air pollution control

The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

Combustion Data (if applie		
(a) Type and amount in appro	opriate units of fuel(s) to be burned:	
(a) 13po ana		
Diesel, 900 gal/year	Bell	
(b) Chemical analysis of prosulfur and ash:	oposed fuel(s), excluding coal, includ	ing maximum percent
Sulfur and ash are insignifica	ant.	
(c) Theoretical combustion a	air requirement (ACF/unit of fuel):	
Unk @	°F and	psia.
(d) Percent excess air: Ur	nk	
(a) Type and RTI I/br of burn	ners and all other firing equipment plann	ed to be used:
(e) Type and Broth of batt		
		and give sizing
(f) If coal is proposed as a	a source of fuel, identify supplier and s	eams and give sizing
(f) If coal is proposed as a the coal as it will be fire	a source of fuel, identify supplier and s d:	eams and give sizing
(f) If coal is proposed as a the coal as it will be fire	a source of fuel, identify supplier and s d:	eams and give sizing
the coal as it will be life	a source of fuel, identify supplier and s d:	eams and give sizing
(f) If coal is proposed as a the coal as it will be fired	a source of fuel, identify supplier and s d:	eams and give sizing
the coal as it will be life	a source of fuel, identify supplier and s d:	eams and give sizing
the coal as it will be life.	u.	
the coal as it will be life	u.	eams and give sizing × 10 <sup>6</sup> BTU/hr.
the coal as it will be life.	esign heat input: 0.25	

@	~60	°F and		14.5 psia
	NO <sub>X</sub>	0.25	lb/hr	grains/ACF
).	SO <sub>2</sub>	0.07	lb/hr	grains/ACF
<b>)</b> .	CO	0.29	lb/hr	grains/ACF
d.	PM <sub>10</sub>	0.002	lb/hr	grains/ACF
Э.	Hydrocarbons	NA	lb/hr	grains/ACF
f.	VOCs	0.25	lb/hr	grains/ACF
g.	Pb	NA	lb/hr	grains/ACF
h.	Specify other(s)			
			lb/hr	grains/ACI
			lb/hr	grains/AC
			lb/hr	grains/AC
			lb/hr	grains/AC

NOTE:

<sup>(1)</sup> An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

<sup>(2)</sup> Complete the Emission Points Data Sheet.

compliance with the proposed operating per	rameters. Please propose testing in order to
REPORTING As required	TESTING NA
PROPOSED TO BE MONITORED IN ORDER TO DEN	HE PROCESS PARAMETERS AND RANGES THAT ARE MONSTRATE COMPLIANCE WITH THE OPERATION OF JTION CONTROL DEVICE. ROPOSED RECORDKEEPING THAT WILL ACCOMPANY
THE MONITORING.  REPORTING. PLEASE DESCRIBE THE PROPERTY.	ROPOSED FREQUENCY OF REPORTING OF THE
	aintenance procedures required by Manufacturer

## Chemical Process/Leak Source Data Sheet

#### Attachment L EMISSIONS UNIT DATA SHEET CHEMICAL PROCESS

			Discool
For chen	nical processes please fill out supplementary forms that hav	t this sheet and all supplementary for re been completed.	ms (see below) that apply. Please
	mergency Vent Summary Sho eak Sources Data Sheet oxicology Data Sheet Reactor Data Sheet	eet	
<u> </u>	Distillation Column Data Sheet	and equipment ID number (as shown in	n Equipment List Form)
Com	ponents in natural gas and ligh	III liquid service.	
1311		ion Codes (SICs) for process(es)	
3. Natu	_ist raw materials and ⊠ attac ral gas and natural gas liquids	ch MSDSs s.	
		1 To thook MSDSs	
1		Production and  attach MSDSs	Maximum Annual (ton/year)
Descrip	ion and CAS Number	Maximum Hourly (lb/hr)	
5.	Complete the Emergency Ver	nt Summary Sheet for all emergency re	elief devices.
ma me	inplete the Leak Source Data intenance program to minimi thods, planned inspection fred prequirement (e.g. 40CFR60,	a Sheet and describe below of attack ize fugitive emissions. Include detect quency, and record-keeping and simila Subpart VV), please list those here.	tion instruments, calibration gases or ar pertinent information. If subject to a
The (e.g	e purpose of the LDAR progra g., valves, pump seals, conne to CFR Part 60, Subpart KKK ed to detect leaks, on a monito	am is to detect and reduce/eliminate rectors, flanges, open-ended lines, and , and Method 21. Instruments meeting bring frequency cosistent with the regul	fugitive leaks from facility components others), consistent with the provisions the specifications in Method 21 will be latory provisions stated above.
l ac	cidental spill or release.		es to be followed in the event of ar
l he	the event of an accidental spi notified and immediate steps Emergency Response manu	to stop the spin of referen	ed, emergency response personnel wil emented. More details are contained ir

dati con dup mu who 3B. Des	a sheets (Minpound or cholicate MSDS) tagenicity, teere these are scribe any henducted by t	emical entity emitted to the sheet is not required. In ratogenicity, irritation, and unknown, and provide refealth effects testing or epid the company or required.	air. If nclude other erences emiolo under	TSCA. RCRA or other federal	een listed in Item 3, then a eighted average (TWA) or ld be addressed. Indicate s that are being or may be regulations. Discuss the
9. <b>Wa</b> Ha	a <b>ste Produc</b> t zardous Was	ts - Waste products status ste Section of WVDEP, OAC	Q at (3	04) 926-3647.)	
9A.	Types and a	amounts of wastes to be dis	sposed	l:	
9B.	Method of d	lisposal and location of was	ste disp	oosal facilities: NA Phone:	
	rrier:	" USEDA/State	——— Hazaro	dous Waste Landfill will be used	
9C.	Check here	if approved USEPAUGALE	ating S	Schedule for process or project as	a whole (circle appropriate
10.	1	(hrs/day) (hr/batch)	(days	s), (batches/day), (batches/week)	(days/yr), (weeks/year)
circ	cle units:	(nrs/day) (ni/batch)	(daye	), (54,67,77,77,77,77,77,77,77,77,77,77,77,77,	
10A.	Maximum				
10B. Typical  11. Complete a Reactor Data Sheet for each reactor in this chemical process.					
11	Complete a	a Reactor Data Sheet for ea	ach rea	actor in this chemical process.	hemical process.
12.	Complete a	Distillation Column Data S Monitoring, Recordkeepi	Sheet f	or each distillation column in this o	TOTALISM PLOST
pr pr MONI As sp KKK f	oposed oper oposed emis TORING pecified in Me for Majorsville	rating parameters. Pleas sions limits. ethod 21 and 40CFR60 Su e I and II. As required in 40 DO for the remainder o	ubpart	porting, and resting and reporting in order to demonstrate to demonstrate the reporting in order to demonstr	strate compliance with the
DEDC	ORTING			TESTING	
Same				Same	
order	to demonstr	rate compliance with the oronged	posed	s parameters and ranges that are on of this process equipment ope recordkeeping that will accomparency of reporting of the recordkeep	ny the monitoring. Ding.
TES <sup>-</sup>				ons testing for this process equip	
14. warra	Describe	all operating ranges and	d mair	ntenance procedures required b	y Manufacturer to maintain
1					

Leak Source Data Sheet

\* Number of source components reflects both existing and proposed components at the Majorsville facility.

Leak Source Data Sheet		Author of Source Source			
Source Category	Pollutant	Number of Source	Number of Components Monitored by Frequency <sup>2</sup>	Average Time to Repair (days) <sup>3</sup>	Estimated Annual Emission Rate (lb/yr) <sup>4</sup>
Pumps	Light Liquid VOC <sup>6,7</sup>	38	Per 40CFR60 KKK and OOOO	15	1,432 EPA/TCEQ
	Gas VOC <sup>8</sup>	28	Per 40CFR60 KKK and OOOO	15	195 EPA/TCEQ
	Non-VOC <sup>9</sup>				
Valves <sup>10</sup>	Gas VOC	6,830	Per 40CFR60 KKK and OOOO	15	10,495 EPA/TCEQ
	Light Liquid VOC	3,049	Per 40CFR60 KKK and OOOO	15	4,187 EPA/TCEQ
	Heavy Liquid VOC	19	Per 40CFR60 KKK and OOOO	15	0.00 EPA/TCEQ
	Non-VOC				
Safety Relief	Gas VOC	212	Per 40CFR60 KKK and OOOO	15	461 EPA/TCEQ
Valves	Light Liquid VOC	42	Per 40CFR60 KKK and OOOO	15	183 EPA/TCEQ
Open-ended Lines 12	Voc				
	Non-VOC				
Sampling	Gas VOC				
	Light Liquid VOC				
Compressors	Gas VOC	32	Per 40CFR60 KKK and 0000	15	4 EPA/TCEQ
	Light Liquid-VOC	-3	Per 40CFR60 KKK and OOOO	15	22 EPA/TCEQ
Flanges	Gas VOC	4,821	Per 40CFR60 KKK and OOOO	15	17,283 EPA/TCEQ
	Light Liquid VOC	2,473	Per 40CFR60 KKK and OOOO	15	3,625 EPA/TCEQ
	Heavy Liquid VOC	2	Per 40CFR60 KKK and OOOO	15	0.00 EPA/TCEQ
Other	Gas VOC	14,675	Per 40CFR60 KKK and OOOO	15	25,326 EPA/TCEQ
	Light Liquid VOC	4,946	Per 40CFR60 KKK and OOOO	15	13,539 EPA/TCEQ

<sup>&</sup>lt;sup>1-13</sup> See notes on the following page.

\* EPA - 453/R-93-026, Protocol for Equipment Leak Emission Estimates, Updated November 1995. and TCEQ Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives October 2000.

#### **Notes for Leak Source Data Sheet**

- For VOC sources include components on streams and equipment that contain greater than 10% w/w VOC, including feed streams, reaction/separation facilities, and product/by-product delivery lines. Do not include certain leakless equipment as defined below by category.
- 2. By monitoring frequency, give the number of sources routinely monitored for leaks, using a portable detection device that measures concentration in ppm. Do not include monitoring by visual or soap-bubble leak detection methods. "M/Q(M)/Q/SA/A/O" means the time period between inspections as follows:

Monthly/Quarterly, with Monthly follow-up of repaired leakers/Quarterly/Semi-annual/Annually/Other (specify time period)

If source category is not monitored, a single zero in the space will suffice. For example, if 50 gasservice valves are monitored quarterly, with monthly follow-up of those repaired, 75 are monitored semi-annually, and 50 are checked bimonthly (alternate months), with non checked at any other frequency, you would put in the category "valves, gas service:" 0/50/0/75/0/50 (bimonthly).

- 3. Give the average number of days, after a leak is discovered, that an attempt will be made to repair the leak.
- Note the method used: MB material balance; EE engineering estimate; EPA emission factors established by EPA (cite document used); O - other method, such as in-house emission factor (specify).
- Do not include in the equipment count sealless pumps (canned motor or diaphragm) or those with enclosed venting to a control device. (Emissions from vented equipment should be included in the estimates given in the Emission Points Data Sheet.)
- 6. Volatile organic compounds (VOC) means the term as defined in 40 CFR □51.100 (s).
- 7. A light liquid is defined as a fluid with vapor pressure equal to or greater than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if 20% w/w or more of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a light liquid.
- 8. A heavy liquid is defined as a fluid with a vapor pressure less than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if less than 20% w/w of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a heavy liquid.
- 9. LIST CO, H<sub>2</sub>S, mineral acids, NO, NO<sub>2</sub>, SO<sub>3</sub>, etc. DO NOT LIST CO<sub>2</sub>, H<sub>2</sub>, H<sub>2</sub>O, N<sub>2</sub>, O<sub>2</sub>, and Noble Gases.
- 10. Include all process valves whether in-line or on an open-ended line such as sample, drain and purge valves. Do not include safety-relief valves, or leakless valves such as check, diaphragm, and bellows seal valves.
- 11. Do not include a safety-relief valve if there is a rupture disk in place upstream of the valve, or if the valve vents to a control device.
- 12 Open-ended lines include purge, drain and vent lines. Do not include sampling connections, or lines sealed by plugs, caps, blinds or second valves.
- 13. Do not include closed-purge sampling connections.

## Attachment M: Air Pollution Control Device- Flares

No new flares will be permitted with this application.

## **Attachment N: Supporting Emissions Calculations**

#### Summary of Potential Emissions

			Potential Em	issions (tpy)		
Process/Facility	NOx	со	voc	SO <sub>2</sub>	PM <sup>1</sup>	HAPs
300.00	11.44	4,35	7.32	0.04	0.69	3.17
Compressor Engine (C-102)	11.44		7.32	0.04	0.69	3.17
Compressor Engine (C-103)	11.44		7.32	0.04	0.69	3.17
Compressor Engine (C-104)	1.32	2.02	0.13	0.01	0.18	0.05
Regeneration Heater (H-741)	1.32	2.02	0.13	0.01	0.18	0.05
Regeneration Heater (H-2741)	1.80		0.18	0.02	0.25	0.06
Regeneration Heater (H-3741)	1.80		0.18	0.02	0.25	0.06
Regeneration Heater (H-4741)	1.80		0.18	0.02	0.25	0.06
Regeneration Heater (H-5741)	1.80		0.18	0.02	0,25	0.06
Regeneration Heater (H-6741)			0.18	0.02	0.25	0.06
Regeneration Heater (H-7741)	1.80		0.36	0.04	0.50	0.12
Hot Oil Heater (H-781)	5.85		0.38	0.04	0.52	0.13
Hot Oil Heater (H-3781)	7.04		0.38	0.04	0.52	0.13
Hot Oil Heater (H-4781)	7.04		0,38	0.04	0.52	0.13
Hot Oil Heater (H-7781)	7.04		2,82	0.31	3.89	0.97
DeEthanizer HMO (H-1782)	15.6		2.82	0.31	3.89	0.97
DeEthanizer HMO (H-2782)	15.6		1.19	0.04	0.81	0.12
DeEthanizer Regeneration Heater (H-1741)	2.50		1.19	0.04	0.81	0.12
DeEthanizer Regeneration Heater (H-2741)	2.5		0,25	0.03	0.35	0.09
Stabilization Heater (H-4782)	2.74		0.14	0.00	0.01	0.01
Majorsville I & II Emergency Gen (M1-G-1)	0.2		0.00	0.14	0.06	0.00
Majorsville III Emergency Gen (M3-G-2)	0.1		0.00	0.14	0.06	0.00
Majorsville III MCC Emergency Gen (M3-G-3)	0.1		0.00	0.14	0.06	0.00
Majorsville IV MCC Emergency Gen (M4-G-6)	0.1		0.00	0.14	0.06	0.00
Majorsville IV Emergency Gen (M4-G-7)	0.1			0.14	0.06	0.00
Majorsville VII Emergency Gen (M7-G-8)	0.1		0.00	0.14	0.06	0.00
Majorsville VII MCC Emergency Gen (M7-G-9)	0.1			0.14	0.00	0.00
DeEth I Control Room Emergency Gen (MD1-G-4)	0.1		0.10	0.02	0.00	0.00
DeEth I Emergency Gen (MD1-G-5)	0.0		0.06 0.10	0.02	0.00	0.00
DeEth II Control Room Emergency Gen (MD2-G-10)	0.1			0.03	0,00	0.00
DeEth II Emergency Gen (MD2-G-11)	0.0		0.06	0.02	0.02	144
Emergency Flare (FL-991) - MI, II, III, V	0.2		0.01	0.00	0.01	-
Emergency Flare (FL-1991) - DeEth, MIV, MVI, MVII	0.3		0.01	0,00	0,01	0.08
Blowdown Emissions	-		1.75		3.535	0.29
Fugitive Emissions (FUG-901)			38.38	2.08	15,89	13.07
Site Wide Emissions (tpy)	114	.06 99.15	73,54	4,00	10,000	

 $<sup>^{1}</sup>$   $PM = PM_{10} = PM_{2.5}$ 

#### Summary of Potential Emissions

iteria Pollutant Potential Emissions			Potential Emi	ssions (lb/hr)		
Process/Facility	NOx	CO	VOC	SO <sub>2</sub>	PM <sup>1</sup>	HAPs
7 (0.103)	2.61	0.99	1.67	0.01	0.16	0.72
Compressor Engine (C-102)	2.61	0.99	1.67	0.01	0.16	0.72
Compressor Engine (C-103)	2,61	0.99	1.67	0.01	0.16	0.72
Compressor Engine (C-104)	0.30	0.46	0.03	0.00	0.04	0.01
Regeneration Heater (H-741)	0,30	0.46	0.03	0.00	0.04	0.01
Regeneration Heater (H-2741)	0.41	0,32	0.04	0.00	0.06	10.0
Regeneration Heater (H-3741)	0.41	0.32	0.04	0.00	0.06	0.01
Regeneration Heater (H-4741)	0.41	0.32	0.04	0.00	0.06	0.01
Regeneration Heater (H-5741)	0.41	0.32	0.04	0.00	0.06	0.01
Regeneration Heater (H-6741)		0.32	0.04	0.00	0.06	0.01
Regeneration Heater (H-7741)	0.41 1,33	1.27	0.08	0.01	0.11	0.03
Hot Oil Heater (H-781)		1.32	0.09	0.01	0.12	0.03
Hot Oil Heater (H-3781)	1.61	1.32	0.09	0.01	0.12	0.03
Hot Oil Heater (H-4781)	1.61		0.09	0.01	0.12	0.03
Hot Oil Heater (H-7781)	1.61	1,32	0.64	0.07	0.89	0.22
DeEthanizer HMO (H-1782)	3.58	4.77	0,64	0.07	0.89	0.22
DeEthanizer HMO (H-2782)	3,58	4.77	0.04	0.01	0.19	0.03
DeEthanizer Regeneration Heater (H-1741)	0.57	0.58	0.27	0.01	0.19	0.03
DeEthanizer Regeneration Heater (H-2741)	0.57	0.58		0.01	0.08	0.02
Stabilization Heater (H-4782)	0.62	0.88	0.06	0.00	0.02	0.04
Majorsville I & II Emergency Gen (M1-G-1)	1.12	1.68	0.56	0.58	0.23	0.01
Majorsville III Emergency Gen (M3-G-2)	0.70	0.18	0.02		0.23	0.01
Majorsville III MCC Emergency Gen (M3-G-3)	0.70	0.18	0.02	0.58	0.23	0.01
Majorsville IV MCC Emergency Gen (M4-G-6)	0.70	0,18	0.02	0.58	0.23	0.01
Majorsville IV Emergency Gen (M4-G-7)	0.70	0.18	0.02	0.58	0,23	0.01
Majorsville VII Emergency Gen (M7-G-8)	0.70	0.18	0.02	0.58	0.23	0.01
Majorsville VII MCC Emergency Gen (M7-G-9)	0.70	0.18	0.02	0.58		0.00
DeEth I Control Room Emergency Gen (MD1-G-4)	0,41	0.43	0.41	0.11	0.00	0.00
DeEth I Emergency Gen (MD1-G-5)	0,25	0.29	0,25	0.07	0.00	0.00
DeEth II Control Room Emergency Gen (MD2-G-10)	0.41	0.43	0.41	0.11	0.00	0.00
DeEth II Emergency Gen (MD2-G-11)	0.25	0.29	0.25	0.07	0.00	0.00
Emergency Flare (FL-991) - MI, II, III, V	0.05	0.04	0.00	0.00	0.00	
Emergency Flare (FL-991) - DeEth, MIV, MVI, MVII	0.49	2.47	0.00	0.00	0.00	
	-	-	0.40			0.02
Blowdown Emissions		-	8.76			0.07
Fugitive Emissions (FUG-001) Site Wide Emissions (lb/hr)	32.76	29.01	18.65	4.07	4.96	3.11

 $<sup>^{1}</sup>$  PM = PM<sub>10</sub> = PM<sub>2.5</sub>

#### Summary of Potential Emissions

ardous Air Pollutant Potential Emissions		H	APs - Potential	Emissions (II	b/hr)	v
Process/Facility	Benzene	Ethylbenzene	Toluene	Xylenes	п-Нехапе	Formaldehyd
Compressor Engine (C-102)	6.91E-03	6.24E-04	6.41E-03	2.89E-03	1.74E-02	4.18E-01
	6,91E-03	6.24E-04	6.41E-03	2.89E-03	1.74E-02	4.18E-01
Compressor Engine (C-103)	6.91E-03	6.24E-04	6.41E-03	2.89E-03	1.74E-02	4.18E-01
Compressor Engine (C-104)	1.15E-05		1.87E-05	122	9.88E-03	4.12E-04
egeneration Heater (H-741)	1.15E-05	3.77	1.87E-05		9.88E-03	4.12E-04
egeneration Heater (H-2741)	1.58E-05		2.56E-05		1.36E-02	5.65E-04
egeneration Heater (H-3741)	1.58E-05		2.56E-05	-	1.36E-02	5.65E-04
egeneration Heater (H-4741)	1.58E-05		2.56E-05		1.36E-02	5.65E-04
Regeneration Heater (H-5741)	1.58E-05	227	2.56E-05	1000	1.36E-02	5.65E-04
tegeneration Heater (H-6741)	1.58E-05	40	2.56E-05		1.36E-02	5,65E-04
tegeneration Heater (H-7741)	3.17E-05		5.13E-05	_	2.72E-02	1.13E-03
Iot Oil Heater (H-781)	3.31E-05	227	5.36E-05		2.84E-02	1.18E-03
Hot Oil Heater (H-3781)	3.31E-05	-	5.36E-05	-	2.84E-02	1.18E-03
lot Oil Heater (H-4781)	3.31E-05	_	5.36E-05	127	2.84E-02	1.18E-03
Iot Oil Heater (H-7781)	2.45E-04	-	3.97E-04	_	2.10E-01	8.76E-03
DeEthanizer HMO (H-1782)		-	3.97E-04		2.10E-01	8.76E-03
DeEthanizer HMO (H-2782)	2.45E-04		4.75E-05	220	2.51E-02	1.05E-03
DeEthanizer Regeneration Heater (H-1741)	2.93E-05	-	4.75E-05	346	2.51E-02	1.05E-03
DeEthanizer Regeneration Heater (H-2741)	2.93E-05	-	3.55E-05		1.88E-02	7.83E-04
Stabilization Heater (H-4782)	2.19E-05		8.58E-04	3.87E-04		5.36E-03
Majorsville I & II Emergency Gen (M1-G-1)	9,25E-04	8.35E-05	1.57E-03			4.54E-03
Majorsville III Emergency Gen (M3-G-2)	3.59E-03	-	1.57E-03	_		4.54E-03
Majorsville III MCC Emergency Gen (M3-G-3)	3.59E-03	-	1.57E-03	_	_	4.54E-0
Majorsville IV MCC Emergency Gen (M4-G-6)	3.59E-03	-	1.57E-03	-		4.54E-0
Majorsville IV Emergency Gen (M4-G-7)	3.59E-03		1.57E-03		-	4.54E-0
Majorsville VII Emergency Gen (M7-G-8)	3.59E-03		1.57E-03	_		4.54E-0
Majorsville VII MCC Emergency Gen (M7-G-9)	3.59E-03	:: <del></del>	1.69E-04	-	-	4.86E-0
DeEth I Control Room Emergency Gen (MD1-G-4)	3.85E-04	-		_	_	2.92E-0
DeEth I Emergency Gen (MD1-G-5)	2,31E-04		1.01E-04	_	-	4.86E-0
DeEth II Control Room Emergency Gen (MD2-G-10)	3.85E-04	-	1.69E-04	-	_	2.92E-0
DeEth II Emergency Gen (MD2-G-11)	2,31E-04		1.01E-04		-	
Emergency Flare (FL-991) - MI, II, III, V				-		_
Emergency Flare (FL-1991) - DeEth, MIV, MVI, MVII	-	-	_			_
Blowdown Emissions	-				1075	
Fugitive Emissions (FUG-001)		- 2		0.01	0.74	1,32
Site Wide Emissions (lb/hr)	0,05	0.00	0.03	0.01	0.74	1,52

#### Summary of Potential Emissions

		Н	APs - Potentia		tpy)	Formaldehyde
Process/Facility	Benzene	Ethylbenzene	Toluene	Xylenes	n-Hexane	1.29E+00
F (C 103)	2.14E-02	1.93E-03	1.98E-02	8.95E-03	5.40E-02	1.29E+00 1.29E+00
Compressor Engine (C-102) Compressor Engine (C-103)	2,14E-02	1.93E-03	1.98E-02	8.95E-03	5.40E-02 5.40E-02	1.29E+00
Compressor Engine (C-104)	2.14E-02	1.93E-03	1.98E-02	8.95E-03		1.80E-03
Regeneration Heater (H-741)	5.05E-05		8.18E-05		4.33E-02	1.80E-03
Regeneration Heater (H-2741)	5.05E-05	-	8.18E-05		4.33E-02	2.48E-03
Regeneration Heater (H-3741)	6.93E-05	**	1.12E-04		5,94E-02	2.48E-03
Regeneration Heater (H-4741)	6.93E-05		1.12E-04	_	5.94E-02	2.48E-03
Regeneration Heater (H-5741)	6.93E-05		1.12E-04		5.94E-02	
Regeneration Heater (H-6741)	6.93E-05		1.12E-04		5.94E-02	2.48E-03
Regeneration Heater (H-7741)	6.93E-05		1.12E-04		5,94E-02	2.48E-03
	1.39E-04	-	2.25E-04	-	1.19E-01	4.96E-03
Hot Oil Heater (H-781)	1.45E-04		2.35E-04		1.24E-01	5.18E-03
Hot Oil Heater (H-3781)	1.45E-04		2.35E-04		1.24E-01	5.18E-03
Hot Oil Heater (H-4781)	1.45E-04		2.35E-04	-	1.24E-01	5.18E-03
Hot Oil Heater (H-7781)	1.07E-03	-	1.74E-03		9.21E-01	3.84E-02
DeEthanizer HMO (H-1782)	1.07E-03	1,000	1.74E-03	-	9.21E-01	3.84E-02
DeEthanizer HMO (H-2782)	1.29E-04		2.08E-04		1.10E-01	4.59E-03
DeEthanizer Regeneration Heater (H-1741)	1.29E-04	_	2.08E-04		1.10E-01	4.59E-03
DeEthanizer Regeneration Heater (H-2741)	9.61E-05	**	1.56E-04	7.22	8.23E-02	3.43E-03
Stabilization Heater (H-4782)	2.31E-04	2.09E-05	2.14E-04	9,67E-05	_	1,34E-03
Majorsville I & II Emergency Gen (M1-G-1)	8.97E-04		3.93E-04	-		1.13E-03
Majorsville III Emergency Gen (M3-G-2)	8.97E-04	_	3.93E-04	22.7	344	1.13E-03
Majorsville III MCC Emergency Gen (M3-G-3)	8,97E-04	_	3,93E-04	_		1.13E-03
Majorsville IV MCC Emergency Gen (M4-G-6)	8.97E-04		3.93E-04	_	_	1.13E-03
Majorsville IV Emergency Gen (M4-G-7)	8.97E-04		3.93E-04	220	-	1.13E-03
Majorsville VII Emergency Gen (M7-G-8)	8.97E-04		3.93E-04	_	-	1.13E-03
Majorsville VII MCC Emergency Gen (M7-G-9)	9.61E-05		4.21E-05	_	_	1.22E-04
DeEth I Control Room Emergency Gen (MD1-G-4)			2.53E-05		-	7.29E-05
DeEth I Emergency Gen (MD1-G-5)	5.77E-05		4,21E-05		_	1.22E-04
DeEth II Control Room Emergency Gen (MD2-G-10)	9.61E-05		2.53E-05		_	7.29E-05
DeEth II Emergency Gen (MD2-G-11)	5.77E-05		2.502 00	227	**	
Emergency Flare (FL-991) - MI, II, III, V	-		-		77.0	_
Emergency Flare (FL-1991) - DeEth, MIV, MVI, MVII	_					
Blowdown Emissions	1 -					
Fugitive Emissions (FUG-001)		0.01	0.07	0.03	3.18	4.02
Site Wide Emissions (tpy)	0.07	0.01	0.07			

1

# Emergency Generator Engine Emissions (Per Engine) (M3-G-2, M3-G-3, M4-G-6, M4-G-7, M7-G-8, & M7-G-9)

Source Designation:	Cummins
Manufacturer:	60 DSFAD
Model No.:	4-stroke
Stroke Cycle:	Diesel
Type of Burn:	2014
Year Installed	
Fuel Used:	Diesel
Fuel High Heating Value (HHV) (Btu/gal):	137,380
Rated Horsepower (bhp):	145
Specific Fuel Consumption (gal/hr)	28.0
Maximum Fuel Consumption at 100% Load (gal/hr):	28.0
Waximum Fuel Consumption at 1000	3.85
Heat Input (MMBtu/hr) Stack Designation:	TBD

#### **Operational Details:**

Potential Annual Hours of Operation (hr/yr): Potential Fuel Consumption (gal/yr):	500 14,000

## Criteria and Manufacturer Specific Pollutant Emission Factors:

Pollutant	Emission Factors <sup>a</sup>	Units
	2,20	g/bhp-hr
NOx	0.56	g/bhp-hr
CO (uncontrolled)	0.56	g/bhp-hr
CO (controlled)	1.50E-01	lb/hp-hr
SO <sub>2</sub>	6.00E-02	lb/hp-hr
PM <sub>10</sub> (Filterable)	6.00E-02	lb/hp-hr
PM <sub>2.5</sub> (Filterable)	6.00E-02	g/bhp-hr
PM Condensable	6.00E-02	g/bhp-hr
PM Total	0.05	g/bhp-hr
VOC (uncontrolled) VOC (controlled)	0.05	g/bhp-hr

## **Emergency Generator Engine Emissions (Per Engine)** (M3-G-2, M3-G-3, M4-G-6, M4-G-7, M7-G-8, & M7-G-9)

## Criteria and Manufacturer Specific Pollutant Emission Rates

	Potential	Emissions
Pollutant	(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>
	0.70	0.18
NO <sub>x</sub>	0.18	0.04
CO (uncontrolled)	0.18	0.04
CO (controlled)	0.58	0.14
SO <sub>2</sub>	0.231	0.06
PM <sub>10</sub> (Filterable)	0.231	0.06
PM <sub>2.5</sub> (Filterable)		0.06
PM Condensable	0.23	0.06
PM Total	0.23	0.00
VOC (uncontrolled)	0.02	0.00
VOC (controlled)	0.02	0.00

## Hazardous Air Pollutant (HAP) Potential Emissions

	Emission Factor	Potential Emissions		
Pollutant	(lb/MMBtu) <sup>a</sup>	(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>	
IAPs:	7.67E-04	2.95E-03	7.38E-04	
Acetaldehyde	9.25E-05	3.56E-04	8.90E-05	
Acrolein	9.23E-03 9.33E-04	3.59E-03	8.97E-04	
Benzene	9.33E-04 3.91E-05	1.50E-04	3.76E-05	
1,3-Butadiene	1.18E-03	4.54E-03	1.13E-03	
Formaldehyde		1.57E-03	3.93E-04	
Foluene Xylene	4.09E-04 2.85E-04	1.10E-03	2.74E-04	
Polycyclic Organic Matter:	8,48E-05	3.26E-04	8.15E-05	
Naphthalene				
Total HAP		0.01	0.00	

<sup>&</sup>lt;sup>a</sup> HAP emission factors from AP-42 Section 3.2, Table 3.3-2 "Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines,"

<sup>&</sup>lt;sup>b</sup> Emission Rate (lb/hr) = Rated Capacity (MMBtu/hr or bhp) × Emission Factor (lb/MMBtu or lb/bhp-hr).

<sup>&</sup>lt;sup>c</sup> Annual Emissions (tons/yr)<sub>Potential</sub> =  $(lb/hr)_{Emissions} \times (Maximum Allowable Operating Hours/yr) \times (1 ton/2000 lb)$ .

## **Exhaust Emission Data Sheet** 60DSFAD



60 Hz Diesel Generator Set **EPA Emission: Tier 3** 

4.21 in. (107 mm)

4.88 in. (124 mm)

275 cu. in. (4.5 liters)

**Engine Information:** 

Model:

Cummins Inc. QSB5-G3 NR3

Type: Aspiration: 4 Cycle, In-line, 4 Cylinder Diesel

Turbocharged and CAC

Compression Ratio:

17.2:1

Turbocharged with Charge Air Cooled **Emission Control Device:** 

	1/4	1/2	3/4	Full	<u>Full</u>
	Standby	Standby	Standby	Standby	<u>Prime</u>
PERFORMANCE DATA		51	77	103	92
BHP @ 1800 RPM (60 Hz)	26		4.6	5.7	5.3
Fuel Consumption (gal/Hr)	1.8	3.0		665	646
Exhaust Gas Flow (CFM)	308	433	596		765
Exhaust Gas Temperature (°F)	500	624	727	778	
Exhaust Gas Temperature (1)					
EXHAUST EMISSION DATA					
			0.07	0.04	0.0
HC (Total Unburned Hydrocarbons)	0.24	0.11	0.07		2.2
NOx (Oxides of Nitrogen as NO2)	2.76	2.15	2.09	2.37	
NOX (Oxides of Minogen do 1102)	2.27	1.18	0.63	0.50	0.5
CO (carbon Monoxide)	0.28	0.14	0.05	0.06	0.0
PM (Particular Matter)	0.19	0.16	0.15	0.14	0.1
SO2 (Sulfur Dioxide)		0.60	0.31	0.38	0.3
Smoke (Bosch)	0.76	0.00 ]	All	values are Grams	per HP-Ho

#### **TEST CONDITIONS**

Data is representative of steady-state engine speed (± 25 RPM) at designated genset loads. Pressures, temperatures, and emission rates were stabilized.

Fuel Specification:

ASTM D975 No. 2-D diesel fuel with 0.03-0.05% sulfur content (by weight), and 40-48 cetane

Bore:

Stroke:

Displacement:

number.

Fuel Temperature:

99 ± 9 °F (at fuel pump inlet)

Intake Air Temperature: Barometric Pressure:

77 ± 9 °F

29.6 ± 1 in. Hg

Humidity:

NOx measurement corrected to 75 grains H2O/lb dry air

Reference Standard:

ISO 8178

The NOx, HC, CO and PM emission data tabulated here were taken from a single engine under the test conditions shown above. Data for the other components are estimated. These data are subjected to instrumentation and engine-to-engine variability. Field emission test data are not guaranteed to these levels. Actual field test results may vary due to test site conditions, installation, fuel specification, test procedures and instrumentation. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may results in elevated emission levels.



## 2013 EPA Tier 3 Exhaust Emission Compliance Statement 60DSFAD

## **Stationary Emergency** 60 Hz Diesel Generator Set

Compliance Information:

The engine used in this generator set complies with Tier 3 emissions limit of U.S. EPA New Source Performance Standards for stationary emergency engines under the provisions of 40 CFR 60 Subpart IIII when tested per ISO8178 D2.

Engine Manufacturer:

EPA Certificate Number:

Effective Date:

Date Issued:

EPA Engine Family (Cummins Emissions Family):

Cummins Inc.

DCEXL0275AAG-003

05/01/2012

05/01/2012

DCEXL0275AAG (A323)

**Engine Information:** 

Model:

QSB4.5 / QSB5 / QSB5-G3 NR3

Engine Nameplate HP:

145

4 Cycle, In-line, 4 Cylinder Diesel

Type: Aspiration: Turbocharged and CAC

Emission Control Device:

Bore:

4.21 in. (107 mm)

Stroke:

4.88 in. (124 mm)

Displacement:

272 cu. in. (4.5 liters)

Compression Ratio:

17.3:1

Exhaust Stack Diameter:

3 in.

Diesel Fuel Emission Limits	Grams per BHP-hr Grams per kWn					
D2 Cycle Exhaust Emissions	NOx +	CO	<u>PM</u>	NOx + NMHC	<u>co</u>	<u>PM</u>
The Lorent ADDD nam Sulfur)	2.8	0.7	0.11	3.8	0.9	0.15
Test Results - Diesel Fuel (300-4000 ppm Sulfur)	3.0	2.6	0.15	4.0	3.5	0.20
EPA Emissions Limit	2.6	0.7	0.10	3.5	0.9	0.13
Test Results - CARB Diesel Fuel (<15 ppm Sulfur)		2.6	0.15	4.0	3.5	0.20
CARB Emissions Limit	3.0	2.0	0.10			

The CARB emission values are based on CARB approved calculations for converting EPA (500 ppm) fuel to CARB (15 ppm) fuel. Test Methods: EPA/CARB Nonroad emissions recorded per 40CFR89 (ref. ISO8178-1) and weighted at load points prescribed in Subpart E, Appendix A for Constant Speed Engines (ref. ISO8178-4, D2)

Diesel Fuel Specifications: Cetane Number: 40-48. Reference: ASTM D975 No. 2-D. Reference Conditions: Air Inlet Temperature: 25°C (77°F), Fuel Inlet Temperature: 40°C (104°F). Barometric Pressure: 100 kPa (29.53 in Hg), Humidity: 10.7 g/kg (75 grains H2O/lb) of dry air; required for NOx correction, Restrictions: Intake Restriction set to a maximum allowable limit for clean filter; Exhaust Back Pressure set to a maximum allowable limit.

Tests conducted using alternate test methods, instrumentation, fuel or reference conditions can yield different results. Engine operation with excessive air intake or exhaust restriction beyond published maximum limits, or with improper maintenance, may result in elevated emission levels.

ISBL

Model: DSFAD
Frequency: 60
Fuel type: Diesel
KW rating: 60 standby

55 prime

Emissions level: EPA NSPS Stationary Emergency Tier 3

## > Generator set data sheet

# Power Generation

	E. B. Chin. D. C. Carlot Conference of the Confe
Exhaust emission data sheet:	EDS-1089
Exhaust emission data silect.	EPA-1123
Exhaust emission compliance sheet:	MSP-1069
Sound performance data sheet:	MCP-176
Cooling performance data sheet:	PTS-275
Prototype test summary data sheet:	0500-4552
Standard set-mounted radiator cooling outline:	
Optional set-mounted radiator cooling outline:	
Optional heat exchanger cooling outline:	
Optional remote radiator cooling outline:	Continuous

Optional remote radiator cod	iing out	me.			<del>'</del>				O-mainments
	Standby				Prime	·			Continuous
Fuel consumption						kW (kVA)			kW (kVA)
	60 (75)				55 (69)				
Ratings	1/4	1/2	3/4	Full	1/4	1/2	3/4	Full	Full
Load		3.0	4.6	5.7	1.7	2.7	4.1	5.3	
US gph	1.8		17.6	21.4	6.4	10.3	15.7	20.2	
L/hr	6.8	11.4	17.0	21.4	1 0		1 -		

L/hr	6.8	11.4	17.0	21.4	<u> </u>	Prime	1
Facino					Standby rating	rating	Continuous rating
Engine				Cummins Inc.			
Engine manufacturer				OSB5-G3 NR3			
Engine model					Cast iron, in-line, 4 c	ylinder	
Configuration					Turbocharged and a	ir-to-air aftercooled	
Aspiration					108 (145)	94 (126)	
Gross engine power output, kWm (bhp)					1133 (164)	1050 (152)	
BMEP at set rated load, kPa	BMEP at set rated load, kPa (psi)				107 (4.21)		
Bore, mm (in.)				124 (4.88)			
Stroke, mm (in.)					1800		
Rated speed, rpm					7.4 (1464)		
Piston speed, m/s (ft/min)							
Compression ratio Lube oil capacity, L (qt)				17.3:1			
				12.1 (12.8)			
				2100 <u>+</u> 50			
	Overspeed limit, rpm				13		
Regenerative power, kW							

Fuel flow  Maximum fuel flow with C180, L/hr (US gph)	106 (28)
Maximum fuel flow with C174, L/hr (US gph)  Maximum fuel inlet restriction with clean filter, mm Hg (in. Hg)	127 (5)
Maximum return restriction, mm Hg (in. Hg)	152 (6)

		Prime	
	Standby rating	rating	Continuous rating
Air	8.0 (284)	7.8 (275)	
Combustion air, m³/min (scfm)	3.7 (15)		
Maximum air cleaner restriction, kPa (in. H,O)	37.0 (1308)		
Alternator cooling air, m³/min (cfm)	37.0 (1300)		
Exhaust	18.8 (665)	18.6 (655)	
Exhaust flow at set rated load, m³/min (cſm)	415 (778)	411 (772)	
Exhaust temperature, °C (°F)	10 (40)		
Maximum back pressure, kPa (in. H <sub>2</sub> O)	10 (40)		
Standard set-mounted radiator cooling	55 (404)		
Ambient design, °C (°F)	55 (131)		
Fan load, kW <sub>m</sub> (HP)	9.3 (12.5)		
Coolant capacity (with radiator), L (US Gal.)	17 (4.5)		
Cooling system air flow, m³/min (scfm)	189 (6675) 3.18 (3010)	3.06 (2900)	W
Total heat rejection, MJ/min (Btu/min)	0.12 (0.5)	3.00 (2344)	
Maximum cooling air flow static restriction, kPa (in. H <sub>2</sub> O)	0.12 (0.5)		
	ı		
Optional set-mounted radiator cooling			
Ambient design, °C (°F)			
Fan Joad, kWm (HP)			
Coolant capacity (with radiator), L (US Gal.)	3 3		
Cooling system air flow, m³/min (scfm)			
Total heat rejection, MJ/min (Btu/min)			
Maximum cooling air flow static restriction, kPa (in. H <sub>2</sub> O)	1		
	ı		
Optional heat exchanger cooling			
Sex appliest appacity 1 (US Gal.)			
Heat rejected, jacket water circuit, MJ/min (Btu/min)			
Heat rejected, aftercooler circuit, MJ/min (Btu/min)			
Heat rejected, fuel circuit, MJ/min (Btu/min)			
Total heat radiated to room, MJ/min (Btu/min)	= 1 1 = 3		
Maximum raw water pressure, jacket water circuit, kPa (psi)	-		
Maximum raw water pressure, aftercooler circuit, kPa (psi)			
Administration pressure fuel circuit, kPa (DSI)			
Maximum raw water flow, jacket water circuit, L/min (US Gai/min)			
Maximum raw water flow, aftercooler circuit, L/min (US Gai/min)			
the discussion flow fuel circuit, L/min (US Ga)/min)			
Minimum raw water flow at 27 °C (80 °F) inlet temp, jacket water			
circuit, L/min (US Gal/min)			
Minimum raw water flow at 27 °C (80 °F) inlet temp, aftercooler circuit			
L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, fuel circuit, L/mir			
(14C C - 1/mi=)			
Daw water delta P at min flow, jacket water circuit, kPa (psi)			
Paw water delta P at min flow, aftercooler circuit, kPa (psi)			
Raw water delta P at min flow, fuel circuit, kPa (psi)			
Maximum jacket water outlet temp, °C (°F)			
* faviorum aftercooler inlet temp. °C (°F)			
Maximum aftercooler inlet temp at 25 °C (77 °F) ambient, °C (°F)			





Optional remote radiator cooling <sup>1</sup>	Standby rating	Prime rating	Continuous rating
Set contant capacity, I. (US gal)		1 ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) (	
Max flow rate at max friction head, jacket water circuit, L/min (US			
gal/min) Max flow rate at max friction head, aftercooler circuit, L/min (US			
gal/min) Heat rejected, jacket water circuit, MJ/min (Btu/min)	HIET TYNERS	LIFE LUCEL DE ME	
Heat rejected, aftercooler circuit, MJ/min (Btu/min)			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Heat rejected, fuel circuit, MJ/min (Btu/min)	The MINE OF		
Total heat radiated to room, MJ/min (Btu/min)			
Maximum friction head, jacket water circuit, kPa (psi)			
Maximum friction head, aftercooler circuit, kPa (psi)			
Maximum static head, jacket water circuit, m (ft)			
Maximum static head, aftercooler circuit, m (ft)			
Maximum jacket water outlet temp, °C (°F)	TO MISSIER 14	3 = 748	
Maximum aftercooler inlet temp at 25 °C (77 °F) ambient, °C (°F)			
Maximum aftercooler inlet temp, °C (°F)	ET 15 DE EE		
Maximum fuel flow, L/hr (US gph)			
Maximum fuel return line restriction, kPa (in Hg)			

## Weights<sup>2</sup>

_	
Unit dry weight kgs (lbs.)	1120 (2470)
Unit wet weight kgs (lbs.)	1140 (2520)
Othe Met Meight rigo (1993)	

<sup>1</sup>For non-standard remote installations contact your local Cummins Power Generation representative.

## **Derating factors**

Defailing factors	Engine power available up to 3050 m (10,000 ft) at ambient temperatures up to 55 °C (131 °F). Consult your Cummins Power Generation distributor for temperature and ambient requirements outside these
Standby	your Cummins Power Generation distributor for temperature and since and sinc
Prime	parameters.  Engine power available up to 3050 m (10,000 ft) at ambient temperatures up to 55 °C (131 °F). Consult your Cummins Power Generation distributor for temperature and ambient requirements outside these parameters.
Continuous	

## Ratings definitions

Applicable for supplying emergency power for the duration of normal power interruption. No sustained overload capability is available for this rating (equivalent to fuel stop power in accordance with ISO3046, AS2789, DIN6271 and BS5514). Nominally rated.  Prime (unlimited running tir Applicable for supplying power in commercially purchased power. power is the maximum power available load for an unlimited numbers. A 10% overload capability for limited time (equivalent to prover in accordance with ISO8528 and opower in accordance with ISO30 DIN6271 and BS5514). This ratia applicable to all generator set in	in lieu of prime continuous power in accordance with ISO8528, ISO3046, AS2789, ing is not Applicable to a constant load up to the full output rating for unlimited hours. No sustained overload capability is available for this rating. Consult authorized distributor for rating (equivalent to continuous power in accordance with ISO8528, ISO3046, AS2789, DIN6271 and BS5514). This rating is not applicable to all generator set models.
-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

## Our energy working for you. $^{\text{\tiny{TM}}}$



<sup>&</sup>lt;sup>2</sup> Weights represent a set with standard features. See outline drawing for weights of other configurations.

#### Alternator data

Alternator da					Lancia	125° C	125° C	125° C	125' C	150° C	150° C	150° C
Three phase table	1	105° C	105° C	105° C	105° C			B414	B303	B416	B413	B419
Feature code		B418	B415	B268	B304	B417	B267		203	204	204	203
Alternator data sheet		204	204	207	204	204	205	204				347/600
number Voltage ranges		110/190 thru 120/208 220/380 thru	120/208 thru 139/240 240/416 thru	120/208 thru 139/240 240/416 thru	347/600	110/190 thru 120/208 220/380 thru 240/416	120/208 thru 139/240 240/416 thru 277/480	120/208 thru 139/240 240/416 thru 277/480	347/600	110/190 thru 120/208 220/380 thru 240/416	120/208 thru 139/240 240/416 thru 277/480	
		240/416	277/480	277/480	66	66	66	66	65	66	66	65
Surge kW		66	66	67			260	231	188	231	231	188
Motor starting kVA (at	Shunt	231	231	360	231	231	200	[23]				-
90% sustained voltage)				400	272	272	306	272	221	272	272	221
	PMG	272	272	423								
Full load current - Amps at standby rating	120/208 208	127/220 197	139/240 180	220/380 2 114		7/480 347/6 90 72						

	,		105° C	105° C	1 105° C	125° C	125° C	125° C	125° C		
Single phase table		105° C				B417	B414	B273	B267	1	
eature code		B418	B415	B274	B268			204	205		1
ternator data sheet		204	204	205	207	204	204	204	200		
imper				1000	- no (n (n)	120/240²	120/240°	120/240	120/2401	Τ	
ltage ranges		120/2402	120/240 <sup>2</sup>	120/240				65	64		
		61	64	66	65	60	63				
otor starting kVA (at	Shunt	130	130	155	215	130	130	130	155		
% sustained voltage)					050	153	153	153	183	1	
	PMG	153	153	183	250	133	1.00				
ill load current - mps at standby rating	120/240°	120/240° 250							14 - 1 0 namer facts		

Single phase power can be taken from a three phase generator set at up to 2/3 set rated 3-phase kW at 1.0 power factor. Also see Note 3

The broad range alternators can supply single phase output up to 2/3 set rated 3-phase kW at 1.0 power factor.

## Formulas for calculating full load currents:

Three phase output

Single phase output

kW x 1000 Voltage x 1.73 x 0.8 kW x SinglePhaseFactor x 1000

Voltage

#### **Cummins Power Generation**

1400 73<sup>rd</sup> Avenue N.E. Minneapolis, MN 55432 USA Phone: 763 574 5000 USA toll-free: 877 769 7669

Fax: 763 574 5298

Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device or after building main switch is open.





<sup>\*</sup> The extended stack (full single phase output) and 4 lead alternators can supply single phase output up to full set rated 3-phase kW at 1.0 power factor.

OSBL

Model: DSFAA

Frequency: 60
Fuel type: Diesel

KW rating: 35 standby

32 prime

Emissions level: EPA NSPS Stationary Emergency Tier 3

## > Generator set data sheet

# Current Power Generation

Exhaust emission data sheet:	EDS-1092
Exhaust emission compliance sheet:	EPA-1126
Sound performance data sheet:	MSP-1072
Sound performance data sheet:	MCP-179
Cooling performance data sheet:	PTS-275
Prototype test summary data sheet: Standard set-mounted radiator cooling outline:	500-4552
Optional set-mounted radiator cooling outline:	
Ontinual heat exchanger cooling outline:	
Optional remote radiator cooling outline:	

Fuel consumption_			ndby (kVA)		Prime	VA)		Continuous kW (kVA)	
Ratings		35	(44)		32 (40)		0.00	Full	Full
Load	1/4	1/2	3/4	Full	1/4	1/2	3/4	_	run
	1.4	2.1	2.9	3.8	1.3	2.0	2.6	3.4	
US gph L/hr	5.2	8.0	10.9	14.3	5.0	7.5	9.9	12.9	

L/hr J.Z J.S	Standby	Prime rating	Continuous rating		
Engine	Cummins Inc.				
Engine manufacturer	OSB5-G3 NR3				
Engine model	Cast iron, in-line, 4	cylinder			
Configuration	Turbocharged and	air-to-air aftercooled			
Aspiration	108 (145)	94 (126)			
Gross engine power output, kWm (bhp)	722 (105)	100 (110)			
BMEP at set rated load, kPa (psi)	107 (4.21)	722 (100)			
Bore, mm (in)					
Stroke, mm (in)		124 (4.88)			
Rated speed, rpm		1800			
Piston speed, m/s (ft/min)	7.4 (1464)	7.4 (1464)			
	17.3:1	17.3:1			
Compression ratio	12.1 (12.8)	12.1 (12.8)			
Lube oil capacity, L (qt)	2100				
Overspeed limit, rpm	13.0				
Regenerative power, kW	1 13.0				

	1
Fuel flow	106 (28)
Maximum fuel flow, L/hr (US gph)  Maximum fuel flow with C174, L/hr (US gph)	100 (20)
Maximum fuel inlet restriction with clean filter, mm Hg (in Hg)	127 (5)
Maximum return restriction, mm Hg (in Hg)	152 (6)

I	Standby	Prime	Continuous
\ir	rating	rating	rating
	6.7 (236)	6.5 (231)	
Combustion air, m³/min (scfm)  Maximum air cleaner restriction with clean filter, kPa (in H <sub>2</sub> O)	3.7 (15)		
Maximum air cleaner restriction with clean filter, kt a (1113)	37.0 (1308)		
Iternator cooling air, m³/min (cfm)			
Exhaust	(7.10)	13.8 (487)	
xhaust flow at set rated load, m³/min (cfm)	14.5 (512)		
xhaust temperature, ° C (° F)	359 (679)	349 (661)	
Naximum back pressure, kPa (in H,O)	10 (40)		
Standard set-mounted radiator cooling			
	55 (131)		
Ambient design, ° C (° F)	9.3 (12.5)		
an load, kW <sub>m</sub> (HP)	17 (4.5)		
Coolant capacity (with radiator), L (US Gal)	189 (6675)		
Cooling system air flow, m³/min (scfm)	2.19 (2075)	2.06 (1956)	
Total heat rejection, MJ/min (Btu/min) Maximum cooling air flow static restriction, kPa (in H,O)	0.12 (0.5)		
Maximum cooling air now static restriction, in a timeyer			
Optional set-mounted radiator cooling			
Ambient design, °C (°F)			
Ambient design, C (17)			
Fan load, kWm (HP)			
Coolant capacity (with radiator), L (US Gal.)			
Cooling system air flow, m³/min (scfm)			
Total heat rejection, MJ/min (Btu/min) Maximum cooling air flow static restriction, kPa (in. H,O)			
Maximum cooling all now static restriction, to 2 through			
Optional heat exchanger cooling			
Set coolant capacity, L (US Gal.)			
Heat rejected, jacket water circuit, MJ/min (Btu/min)			
Heat rejected, aftercooler circuit, MJ/min (Btu/min)			
Heat rejected, fuel circuit, MJ/min (Btu/min)			
Total heat radiated to room, MJ/min (Btu/min)			
Maximum raw water pressure, jacket water circuit, kPa (psi)			
Maximum raw water pressure, aftercooler circuit, kPa (psi)			
Maximum raw water pressure, fuel circuit, kPa (psi)			1 2
Maximum raw water pressure, reserve circuit, L/min (US Gal/min)			
Maximum raw water flow, jacket water circuit, L/min (US Gal/min)			
Maximum raw water flow, jacket water circuit, L/min (US Gal/min)  Maximum raw water flow, aftercooler circuit, L/min (US Gal/min)			
Maximum raw water flow, jacket water circuit, L/min (US Gal/min)  Maximum raw water flow, aftercooler circuit, L/min (US Gal/min)  Maximum raw water flow, fuel circuit, L/min (US Gal/min)			
Maximum raw water flow, jacket water circuit, L/min (US Gal/min)  Maximum raw water flow, aftercooler circuit, L/min (US Gal/min)  Maximum raw water flow, fuel circuit, L/min (US Gal/min)  Minimum raw water flow at 27 °C (80 °F) inlet temp, jacket water			
Maximum raw water flow, jacket water circuit, L/min (US Gal/min)  Maximum raw water flow, aftercooler circuit, L/min (US Gal/min)  Maximum raw water flow, fuel circuit, L/min (US Gal/min)  Minimum raw water flow at 27 °C (80 °F) inlet temp, jacket water circuit, L/min (US Gal/min)  Minimum raw water flow at 27 °C (80 °F) inlet temp, aftercooler circuit,			
Maximum raw water flow, jacket water circuit, L/min (US Gal/min) Maximum raw water flow, aftercooler circuit, L/min (US Gal/min) Maximum raw water flow, fuel circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, jacket water circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, aftercooler circuit,			
Maximum raw water flow, jacket water circuit, L/min (US Gal/min) Maximum raw water flow, aftercooler circuit, L/min (US Gal/min) Maximum raw water flow, fuel circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, jacket water circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, aftercooler circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, fuel circuit, L/min			
Maximum raw water flow, jacket water circuit, L/min (US Gal/min) Maximum raw water flow, aftercooler circuit, L/min (US Gal/min) Maximum raw water flow, fuel circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, jacket water circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, aftercooler circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, fuel circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, fuel circuit, L/min (US Gal/min)			
Maximum raw water flow, jacket water circuit, L/min (US Gal/min) Maximum raw water flow, aftercooler circuit, L/min (US Gal/min) Maximum raw water flow, fuel circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, jacket water circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, aftercooler circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, fuel circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, fuel circuit, L/min (US Gal/min)			
Maximum raw water flow, jacket water circuit, L/min (US Gal/min) Maximum raw water flow, aftercooler circuit, L/min (US Gal/min) Maximum raw water flow, fuel circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, jacket water circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, aftercooler circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, fuel circuit, L/min (US Gal/min) Raw water delta P at min flow, jacket water circuit, kPa (psi)			
Maximum raw water flow, jacket water circuit, L/min (US Gal/min) Maximum raw water flow, aftercooler circuit, L/min (US Gal/min) Maximum raw water flow, fuel circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, jacket water circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, aftercooler circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, fuel circuit, L/min (US Gal/min) Raw water delta P at min flow, jacket water circuit, kPa (psi) Raw water delta P at min flow, fuel circuit, kPa (psi) Raw water delta P at min flow, fuel circuit, kPa (psi)			
Maximum raw water flow, jacket water circuit, L/min (US Gal/min) Maximum raw water flow, aftercooler circuit, L/min (US Gal/min) Maximum raw water flow, fuel circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, jacket water circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, aftercooler circuit, L/min (US Gal/min) Minimum raw water flow at 27 °C (80 °F) inlet temp, fuel circuit, L/min (US Gal/min) Raw water delta P at min flow, jacket water circuit, kPa (psi)			





Optional remote radiator cooling <sup>1</sup>	Standby rating	Prime rating	Continuous rating
Set coolant canacity, L (US gal)			
Max flow rate at max friction head, jacket water circuit, L/min (US			
gal/min) Max flow rate at max friction head, aftercooler circuit, L/min (US			
gal/min) Heat rejected, jacket water circuit, MJ/min (Btu/min)			
Heat rejected, aftercooler circuit, MJ/min (Btu/min)			
Heat rejected, fuel circuit, MJ/min (Btu/min)			
Total heat radiated to room, MJ/min (Btu/min)			
Maximum friction head, jacket water circuit, kPa (psi)	100 5135 11.11		
Maximum friction head, aftercooler circuit, kPa (psi)			
Maximum static head, jacket water circuit, m (ft)			
Maximum static head, aftercooler circuit, m (ft)			
Maximum jacket water outlet temp, °C (°F)			
Maximum aftercooler inlet temp at 25 °C (77 °F) ambient, °C (°F)			
Maximum aftercooler inlet temp, °C (°F)	7///65 /57 559		wolfer Weight
Maximum fuel flow, L/hr (US gph)	MAKE IN IK.		No diales en en
Maximum fuel return line restriction, kPa (in Hg)			

Weights <sup>2</sup>	
Unit dry weight kgs (lbs.)	1060 (2340)
Unit wet weight kgs (lbs.)	1080 (2380)

<sup>&</sup>lt;sup>2</sup> Weights represent a set with standard features. See outline drawing for weights of other configurations.

8	
Derating factors	Engine power available up to 3050 m (10,006 ft) at ambient temperature up to 55° C (131° F). Consult your
Standby	Cummins Power Generation distributor for temperature and smoothing to 55° C (131° F). Consult your
Prime	Engine power available up to 3050 m (10,006 r) at ambient temperature up to do consider these Cummins Power Generation distributor for temperature and ambient requirements outside these parameters.
Continuous	

## **Ratings definitions**

Ratings definitions			Base load (continuous)
Emergency standby power (ESP):	Limited-time running power (LTP):	Prime power (PRP):	power (COP):
Applicable for supplying power to varying electrical load for the duration of power interruption of a reliable utility source. Emergency Standby Power (ESP) is in accordance with ISO 8528. Fuel Stop power in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.	Applicable for supplying power to a constant electrical load for limited hours. Limited Time Running Power (LTP) is in accordance with ISO 8528.	Applicable for supplying power to varying electrical load for unlimited hours. Prime Power (PRP) is in accordance with ISO 8528. Ten percent overload capability is available in accordance with ISO 3046, AS 2789, DIN 6271 and BS 5514.	Applicable for supplying power continuously to a constant electrical load for unlimited hours. Continuous Power (COP) is in accordance with ISO 8528. ISO 3046, AS 2789, DIN 6271 and BS 5514.



For non-standard remote installations contact your local Cummins Power Generation representative.

#### Alternator data

Alternator de	, tu				105 °C	125 °C	125 °C	125 °C	125 °C	150 °C	150 °C	150 °C	
Three Phase Table		105 °C	105 °C	105 °C			B414	B267	B303	B416	B413	B419	
Feature Code		B418	B415	B268	B304	B417			201	201	201	201	
Alternator Data Sheet		201	201	202	201	201	201	202	201	201			
Number				100/200	347/600	110/190	120/208	120/208	347/600	110/190	120/208	347/600	
Voltage Ranges		110/190 Thru 120/208 220/380 Thru 240/416	120/208 Thru 139/240 240/416 Thru 277/480	120/208 Thru 139/240 240/416 Thru 277/480	3477000	Thru 120/208 220/380 Thru 240/416	Thru 139/240 240/416 Thru 277/480	Thru 139/240 240/416 Thru 277/480		Thru 120/208 220/380 Thru 240/416	Thru 139/240 240/416 Thru 277/480		
	L				12	42	41	42	42	42	41	42	
Surge kW		42	41	42	42		131	163	131	131	131	131	
Motor Starting kVA (at	Shunt	131	131	163	131	131	131	103					
90% sustained voltage)				404	155	155	155	191	155	155	155	155	
	PMG	155	155	191	155	133	100						
Full Load Current -	120/20	8 127/22	0 139/2	40 220/	380 240/4			00					

	PMG	155	155	191	155	155	133		 -	 	
Full Load Current - Amps at Standby Rating	120/208 121	127/220 115	139/240 105	220/380 67	240/416 61	<u>277/480</u> 53	347/60 42	<u>.                                    </u>	 		

												1
		105 °C	105 °C	105 °C	105 °C	125 °C	125 °C	125 °C	125 °C		<del></del>	
Single Phase Table				B274	B268	B417	B414	B273	B267			
Feature Code		B418	B415	DZ/4				201	202		7	
Alternator Data Sheet		201	201	202	202	201	201	201	202			
Number				1 (0 10)	120/2403	120/240²	120/240°	120/240 <sup>1</sup>	120/2401	1		
Voltage Ranges		120/240	120/240 <sup>2</sup>	120/240	120/240				40		T	
		40	40	42	40	39	39	41		 	+	<del></del>
Surge kW				25	95	72	72	72	95	1	1	
Motor Starting kVA (at	Shunt	72	72	95	90	1 "		1		 <u> </u>		
90% sustained voltage)						0.5	85	85	112			1
3070 3000	PMG	85	85	112	112	85	95	40				
Full Load Current -	120/24	0° 120/24	O <sub>1</sub>									

Full Load Current - Amps at Standby Rating	120/240° 97	120/240 <sup>3</sup> 146

<sup>&#</sup>x27; Single phase power can be taken from a three phase generator set at up to 2/3 set rated 3-phase kW at 1.0 power factor. Also see Note 3

## Formulas for calculating full load currents:

Three phase output

Single phase output

kW x 1000 Voltage x 1.73 x 0.8 kW x Single Phase Factor x 1000

Voltage

#### **Cummins Power Generation**

1400 73<sup>rd</sup> Avenue N.E. Minneapolis, MN 55432 USA Telephone: 763 574 5000 Fax: 763 574 5298

Warning: Back feed to a utility system can cause electrocution and/or property damage. Do not connect to any building's electrical system except through an approved device or after building main switch is open.

### Our energy working for you.™





The broad range alternators can supply single phase output up to 2/3 set rated 3-phase kW at 1.0 power factor.

The extended stack (full single phase output) and 4 lead alternators can supply single phase output up to full set rated 3-phase kW at 1.0 power factor.

## **Emergency Generator Engine Emissions (Per Engine)** (M1-G-001)

Generac
OT13068KNAC
4-stroke
Lean
2014
Natural Gas
1.020
254
2,061
2,061
2.10
TBD

### **Operational Details:**

Potential Annual Hours of Operation (hr/yr):	500
Potential Fuel Consumption (ft³/yr):	1,030,500

## Criteria and Manufacturer Specific Pollutant Emission Factors:

Pollutant	Emission Factors <sup>a</sup>	Units
10	2.00	g/bhp-hr
VOx	3.00	g/bhp-hr
CO (uncontrolled)	3.00	g/bhp-hr
CO (controlled)	5.88E-04	lb/MMBtu
SO <sub>2</sub>	7.71E-05	lb/MMBtu
PM <sub>10</sub> (Filterable)	7.71E-05	lb/MMBtu
PM <sub>2.5</sub> (Filterable)	9.91E-03	lb/MMBtu
PM Condensable	9.99E-03	lb/MMBtu
PM Total	1.00	g/bhp-hr
VOC (uncontrolled) VOC (controlled)	1.00	g/bhp-hr

### **Emergency Generator Engine Emissions (Per Engine)** (M1-G-001)

## Criteria and Manufacturer Specific Pollutant Emission Rates

	Potential	Emissions
Pollutant	(lb/hr) <sup>b</sup>	(tons/yr)
	1,12	0.28
NO <sub>x</sub>	1.68	0.42
CO (uncontrolled)	1.68	0.42
CO (controlled)	0.001	0.00
SO <sub>2</sub>	0.000	0.00
PM <sub>10</sub> (Filterable)		0.00
PM <sub>2.5</sub> (Filterable)	0.000	0.01
PM Condensable	0.021	
PM Total	0.021	0.01
VOC (uncontrolled)	0.56	0.14
VOC (uncontrolled)	0.56	0.14

	Emission Factor	Potential Emissions			
ollutant	(lb/MMBtu) <sup>2</sup>	(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>		
IAPs:	4.00E-05	8.41E-05	2.10E-05		
,1,2,2-Tetrachloroethane		6.69E-05	1.67E-05		
,1,2-Trichloroethane	3.18E-05	5.61E-04	1.40E-04		
L,3-Butadiene	2.67E-04	5.55E-05	1.39E-05		
1,3-Dichloropropene	2.64E-05	1.76E-02	4.39E-03		
Acetaldehyde	8.36E-03	1.08E-02	2.70E-03		
Acrolein	5.14E-03	9.25E-04	2.31E-04		
Benzene	4.40E-04	7.72E-05	1.93E-05		
Carbon Tetrachloride	3.67E-05	6.39E-05	1.60E-05		
Chlorobenzene	3.04E-05	5.99E-05	1.50E-05		
Chloroform	2.85E-05	8.35E-05	2.09E-05		
Ethylbenzene	3.97E-05	9.31E-05	2.33E-05		
Ethylene Dibromide	4.43E-05	5.36E-03	1.34E-03		
Formaldehyde	2.55E-03	5.26E-03	1.31E-03		
Methanol	2.50E-03	4.20E-05	1.05E-05		
Methylene Chloride	2.00E-05	1.56E-04	3.91E-05		
Naphthalene	7.44E-05	5.65E-05	1.41E-05		
PAH	2.69E-05	4.96E-05	1.24E-05		
Styrene	2.36E-05	8.58E-04	2.14E-04		
Toluene	4.08E-04	3.13E-05	7.83E-06		
Vinyl Chloride	1.49E-05	3.87E-04	9.67E-05		
Xylene	1.84E-04	3.07E V1			
Total HAP		0.04	0.01		

<sup>&</sup>lt;sup>a</sup> SO<sub>2</sub>,PM, and HAP emission factors (excluding HCHO) from AP-42 Section 3.2, Table 3.2-2"Uncontrolled Emission Factors for 4-Stroke

 $<sup>^{</sup>b}$  Emission Rate (lb/hr) = Rated Capacity (MMBtu/hr or bhp) × Emission Factor (lb/MMBtu or lb/bhp-hr).

 $<sup>^{\</sup>circ}$  Annual Emissions (tons/yr) $_{Potential} = (lb/hr)_{Emissions} \times (Maximum Allowable Operating Hours, 8,760 hr/yr) <math>\times$  (1 ton/2000 lb).



## Standby Generator Sets Specifications



### **SPECIFICATIONS**

<b>♦</b> GENERATOR			
Type		Sync	hronous
Rotor Insulation Ulds	SFOIR	ושכב שמו	a Labell
Stator Insulation			Class H
Total Harmonic Distortion			.< 3.5%
Telephone Interference Factor (TIF)			< 50
Alternator Output Leads 1-phase			4-wire
Alternator Output Leads 3-phase			b-wire
Regrings		5ea	aieu daii
Counling		FIEX	INIC DISC
Load Canacity (Standby Rating)			. I DUKVV
* NOTE: Congretor rating and performance in accordance	with ISO852	8-5, BS5514	I, SAE J1349,
ISO3046 and DIN 6271 Standards. KW rating is based	on LPG fuel a	ind may dera	ate with natural
gas.		D	ruchlace
Excitation System		D	CB Size
Generator Output Voltage/kW - 60 Hz	150	625	700
120/240V, 1-phase, 1.0 pf	150		
120/208V, 3-phase, 0.8 pf	150	226	
277/480V, 3-phase, 0.8 pf Generator Locked Rotor KVA Available			
Single-phase or 208 3-phase	w voilage	, DIP 01 0	320 KVA
480V, 3-phase			350 KVA
400 v, 3-phase			
◆ ENGINE			
Make			Generac
Model			V-type
Cylinders and Arrangement			10
Displacement			.6.8 Liter
Rore			0.00 111.
Stroke	.,		4.17 111.
Compression Ratio			9-10-1
Air Intake System	۱۱۱۷	ialuially :	Asplialeu
Valve Seats			Taluelleu
Lifter Type			Hydraulic
<i></i>			
Engine Parameters			
Rated Synchronous RPM		60	HZ, 3600
HP at rated kW		6	0 HZ, 254
Exhaust System			4505 ofm
Exhaust Flow at Rated Output 60 Hz			11000 CIIII
Exhaust Temperature at Rated Output.		***********	1100° F
		1 0	in al
Combustion Air Requiremen	its (Nai	urai G	(dS)
Flow at rated power, 60 Hz		***********	410 CIIII
Governor			Flactronic
Туре		le	ochronous
Fraguency Regulation		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	OCHIOLOGO
Steady State Regulation			± 1/-1/0
Adjustments: Speed			Selectable
Speea			

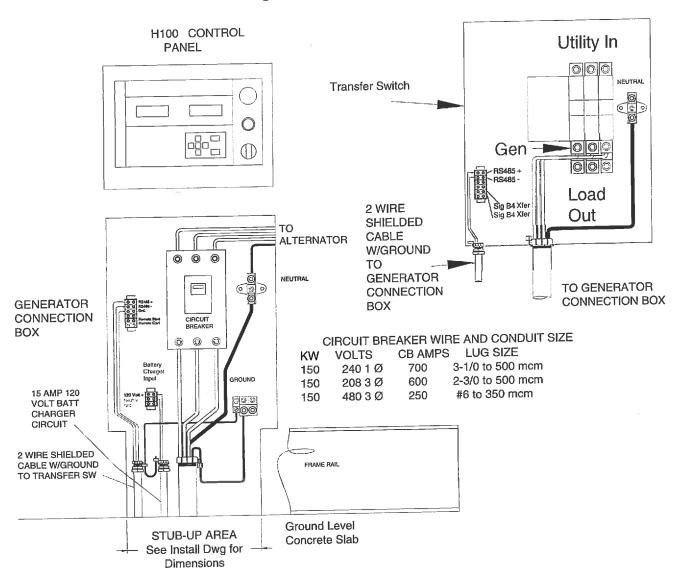
Engine Lubrication System  Type of Oil Pump
▼ COOLING SYSTEM         Type       Closed         Water Pump       Belt Driven         Fan Speed       2200         Fan Diameter       26 inches         Fan Mode       Puller         Air Flow (inlet air including alternator and combustion air)       7800 ft3/min.         Coolant Capacity       (4.5 U.S. gal.)         Heat Rejection to Coolant       568,000 Btu/h         Maximum Operating Air Temp. on Radiator       60° C (150° F)         Maximum Ambient Temperature       50° C (140° F)
♣ FUEL SYSTEM           Type of Fuel
<ul> <li>Engine is not field convertible between natural gas and propane. Jet size and ignition timing are factory set for the specific fuel.</li> </ul>
◆ ELECTRICAL SYSTEM       12V, 30 Amp         Battery Charge Alternator       12V, 2 Amp         Static Battery Charger       12V, 2 Amp         Recommended Battery       24F 525CCA         System Voltage       12 Volts
Voltage Regulator Type
Power Adjustment for Ambient Conditions  Temperature Deration  3% for every 10° C above °C
Controller H-panel



### Standby Generator Sets Specifications



Figure 1 — Interconnections



### **♦ COLD WEATHER KIT**

For cold climates, optional cold weather kit (part number 0F6148A) is recommended. The kit includes:

- Battery Warmer
- 4" Junction Box with hardware
- Thermostat; 20 deg "ON", 40 deg "OFF"
- 6 qt. pack 5W-30 synthetic oil (engine)



### Standby Generator Sets Specifications



### **5.4L & 6.8L IGNITION DESCRIPTION**

This single-fire Ignition is intended to operate with a 10-cylinder, 6.8L engine and an 8-cylinder, 5.4L engine.

The 6.8L engine uses a 40-1 crank sensor, a magpickup CAM sensor and individual coil-on-plug coils for each spark-plug.

The 5.4L engine uses a 36-1 crank sensor, a magpick-up CAM sensor and individual coil-on-plug coils for each spark-plug.

With a single-fire ignition, each high-voltage coil output is connected to one spark plug resulting in that spark plug being fired only during the compression cycle.

Engine Timing versus Engine Speed for the 6.8L engine is:

<u>RPM</u>	NG/LP Engine Timing (BTDC)
1800 rpm	22 degrees

3600 rpm 24 degrees

Engine Timing versus Engine Speed for the 5.4L engine is:

<u>RPM</u>	NG/LP Engine Timing (BTDC)
1800 rpm	26 degrees
3600 rpm	26 degrees

## ◆ IGNITION POWER-UP INPUT ("56 LINE INPUT")

When battery voltage is applied to this input the ignition will power-up. For the ignition to power itself down, battery voltage must be removed from this input.

### **◆ IGNITION ENABLE ("14 LINE INPUT")**

This input must be connected to the +12V battery for the ignition to turn-on the coils. If this input is connected to battery ground the ignition will stop firing the coils and will power down within approximately 2 seconds. In the event that an ignition fault has occurred, however, the ignition will wait 60 seconds before powering down. This allows time to view the diagnostic LED located on the ignition board.

#### NOTE:

The ignition cover does not need to be removed to see the LED.

### ◆ IGNITION SHUTDOWN ON LOSS OF CRANK OR CAM SIGNALS

The ignition will stop firing the coils immediately following the loss of the crank signal. The ignition will stop firing the coils after approx. 3 seconds following the loss of the cam signal.

# ◆ DIAGNOSTIC BLINK PATTERNS (RED LED LOCATED ON THE IGNITION CONTROL BOARD)

During normal ignition operation the RED LED flashes at a 0.5 sec ON and a 0.5 sec OFF rate. This is considered one (1) blink.

LED Fault Code with Priority as shown:

- No Crank Signal: LED blinks 2 times, is OFF for 3.0 seconds and then repeats
- No CAM Signal: LED blinks 3 times, is OFF for 3.0 seconds and then repeats

Only one fault is displayed at a time. If multiple faults exist then the highest priority fault must be resolved prior to a lower priority fault being displayed. In the event that an ignition fault has occurred the ignition will wait 60 seconds before powering down.

#### NOTE:

The ignition cover does not need to be removed to see the LED.

Majorsville Gas Plant

## **Emergency Generator Engine Emissions (Per Engine)**

(MD1-G-4 & MD2-G-10)

•
Generac
MMG45
4-stroke
Diesel
2014
Diesel
137,380
53
3.0
3.0
0.41
TBD
IDD

### **Operational Details:**

Potential Annual Hours of Operation (hr/yr):	500
Potential Fuel Consumption (gal/yr):	1,500

## Criteria and Manufacturer Specific Pollutant Emission Factors:

Pollutant	Emission Factors <sup>a</sup>	Units	
NOx CO (uncontrolled) CO (controlled) SO <sub>2</sub> PM <sub>10</sub> (Filterable) PM <sub>2.5</sub> (Filterable) PM Condensable PM Total VOC (uncontrolled) VOC (controlled)	3.50 3.70 3.70 2.05E-03 2.20E-02 2.20E-02 2.20E-02 2.20E-02 3.50 3.50	g/bhp-hr g/bhp-hr g/bhp-hr g/bhp-hr g/bhp-hr g/bhp-hr g/bhp-hr g/bhp-hr g/bhp-hr	

Majorsville Gas Plant

## Emergency Generator Engine Emissions (Per Engine) (MD1-G-4 & MD2-G-10)

## Criteria and Manufacturer Specific Pollutant Emission Rates

	Potential Emissions			
Pollutant	(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>		
10	0.41	0.10		
NO <sub>x</sub>	0.43	0.11		
CO (uncontrolled)	0,43	0.11		
CO (controlled)	0.11	0.03		
$SO_2$	0.00	0.00		
PM <sub>10</sub> (Filterable)	0.00	0.00		
PM <sub>2.5</sub> (Filterable)		0.00		
PM Condensable	0.00	0.00		
PM Total	0.00	0.10		
VOC (uncontrolled)	0.41	0.10		
VOC (controlled)	0.41	0.10		

	Emission Factor	Potentia	l Emissions	
Pollutant	(lb/MMBtu) <sup>a</sup>	(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>	
		1	= 00D 0#	
HAPs:	7.67E-04	3.16E-04	7.90E-05	
Acetaldehyde	9.25E-05	3.81E-05	9.53E-06	
Acrolein	9.33E-04	3.85E-04	9.61E-05	
Benzene	3,91E-05	1.61E-05	4.03E-06	
,3-Butadiene	1.18E-03	4.86E-04	1.22E-04	
Formaldehyde	4.09E-04	1.69E-04	4.21E-05	
Toluene	2.85E-04	1.17E-04	2.94E-05	
Xylene	2.8JL-04			
Polycyclic Organic Matter:	8.48E-05	3.49E-05	8.74E-06	
Naphthalene				
Total HAP		0.00	0.00	

<sup>&</sup>lt;sup>a</sup> HAP emission factors from AP-42 Section 3.2, Table 3.3-2 "Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines," Supplement F, October 1996. Criteria pollutant factors are based on EPA Tier IV standards.

<sup>&</sup>lt;sup>b</sup> Emission Rate (lb/hr) = Rated Capacity (MMBtu/hr or bhp) × Emission Factor (lb/MMBtu or lb/bhp-hr).

 $<sup>^{</sup>c} \ Annual \ Emissions \ (tons/yr)_{Potential} = (lb/hr)_{Emissions} \times (Maximum \ Allowable \ Operating \ Hours/yr) \times (1 \ ton/2000 \ lb).$ 

## **Emergency Generator Engine Emissions (Per Engine)**

(MD1-G-5 & MD2-G-11)

Source Designation:	Generac
Manufacturer:	
Model No.:	MMG25
Stroke Cycle:	4-stroke
Type of Burn:	Diesel
Year Installed	2014
Fuel Used:	Diesel
Fuel High Heating Value (HHV) (Btu/gal):	137,380
Rated Horsepower (bhp):	32
Specific Fuel Consumption (gal/hr)	1.8
Maximum Fuel Consumption at 100% Load (gal/hr):	1.8
Heat Input (MMBtu/hr)	0.25
Stack Designation:	TBD

### **Operational Details:**

	700
Potential Annual Hours of Operation (hr/yr):	500
Potential Fuel Consumption (gal/yr):	900

## Criteria and Manufacturer Specific Pollutant Emission Factors:

Pollutant	Emission Factors <sup>a</sup>	Units
NO.	3.50	g/bhp-hr
NOx CO (uncontrolled)	4.10	g/bhp-hr
CO (uncontrolled)	4.10	g/bhp-hr
SO <sub>2</sub>	2.05E-03	lb/bhp-hr
	2.20E-02	g/bhp-hr
PM <sub>10</sub> (Filterable)	2.20E-02	g/bhp-hr
PM <sub>2.5</sub> (Filterable)	2.20E-02	g/bhp-hr
PM Condensable	2.20E-02	g/bhp-hr
PM Total	3.50	g/bhp-hr
VOC (uncontrolled) VOC (controlled)	3.50	g/bhp-hr

Majorsville Gas Plant

### Emergency Generator Engine Emissions (Per Engine) (MD1-G-5 & MD2-G-11)

## Criteria and Manufacturer Specific Pollutant Emission Rates

	Potential Emissions			
Pollutant	(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>		
NO.	0.25	0.06		
NO <sub>x</sub>	0.29	0.07		
CO (uncontrolled)	0.29	0.07		
CO (controlled)	0.07	0.02		
SO <sub>2</sub>	0.00	0.00		
PM <sub>10</sub> (Filterable)	0.00	0.00		
PM <sub>2.5</sub> (Filterable)		0.00		
PM Condensable	0.00	0.00		
PM Total	0.00	0.06		
VOC (uncontrolled)	0.25	0.06		
VOC (controlled)	0.25	0.06		

	Emission Factor	Potential Emissions		
Pollutant	(lb/MMBtu) <sup>a</sup>	(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>	
APs:		4 007 04	4.74E-05	
Acetaldehyde	7.67E-04	1.90E-04	5.72E-06	
Acrolein	9.25E-05	2.29E-05 2.31E-04	5.77E-05	
Benzene	9.33E-04	9.67E-06	2.42E-06	
,3-Butadiene	3.91E-05	2.92E-04	7.29E-05	
Formaldehyde	1.18E-03 4.09E-04	1.01E-04	2.53E-05	
Oluene Cylene	2.85E-04	7.05E-05	1.76E-05	
<mark>Polycyclic Organic Matter:</mark> Naphthalene	8.48E-05	2.10E-05	5.24E-06	
Total HAP		0.00	0.00	

<sup>&</sup>lt;sup>a</sup> HAP emission factors from AP-42 Section 3.2, Table 3.3-2 "Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engines," Supplement F, October 1996. Criteria pollutant factors are based on EPA Tier IV standards.

<sup>&</sup>lt;sup>b</sup> Emission Rate (lb/hr) = Rated Capacity (MMBtu/hr or bhp) × Emission Factor (lb/MMBtu or lb/bhp-hr).

<sup>&</sup>lt;sup>c</sup> Annual Emissions (tons/yr)<sub>Potential</sub> =  $(lb/hr)_{Emissions} \times (Maximum Allowable Operating Hours/yr) \times (1 ton/2000 lb)$ .

### Flip-hood Design Standard

Model MMG 35 (shown) Also Available: MMG 25, MMG 45

# Mobile Generator Specifications

subject to change without notice.





Model	MMG-25	WINE 35	MMG-45	MMG 75	MME 100 HM	MMG 100 T3
Model Dutput				00.150	86 / 107	86 / 107
3 Phase - Standby (kW/kVA)	20 / 25	29 / 36	35 / 44	69 / 86	129 / 297	129 / 297
Amps (480/208 V)	30 / 69	43 / 100	53 / 122	103 / 239		78/98
Amps (460/205 V) 3 Phase - Prime (kW/kVA)	18 / 23	26/33	33 / 41	62 / 77	78 / 98	118 / 272
AT A THE OWNER OF THE PERSON O	28 / 64	40/92	49 / 114	93/214	118 / 272	75/75
Amps (480/208 V)	16/16	26 / 26	33 / 33	60 / 60	75 / 75	313
1 Phase - Standby (kW/kVA)	67	108	138	250	313	
Amps (240V)	15/15	25/25	30 / 30	56 / 56	71 / 71	71 / 71
1 Phase - Prime (kW/kVA)	63	104	125	233	296	296
Amps	120, 139, 208,		120, 139, 208,	220, 240, 277	120, 139, 208, 2	
AC Voltage 1-phase	208, 220,		208, 220,		208, 220,	
AC Voltage 3-phase		60	60	60	60	60
Frequency Hz	60		1 (10), 0.8 (30)	1 (1Ø), 0.8 (3Ø)	1.0 (10), .8 (30)	1.0 (10), .8 (3 0)
Power Factor	1 (10), 0.8 (30)	1 (1Ø), 0.8 (3Ø)	Marathon/B		Marath	on/Brushless/H
Generator (Brand/Type/Insulation)		n/Brushless/H		68	68	68
Sound (dB(A) 23 Feet @ prime)	66	68	68 Voc	Yes	Pending	Yes
CSA tisted	Yes	Yes	Yes	, 55	<del>-</del>	
Size and Weight				101 x 40 x 68	101 x 40 x 68	96 x 38 x 62
Skid Mounted (1 x w x h ) in	95 x 35 x 52	95 x 35 x 52	95 x 35 x 52		3790 (1719)	3402 (1543)
Dry Weight Ib (kg)	2048 (929)	2020 (916)	2329 (1056)	3530 (1600)	4740 (2150)	4361 (1978)
Operating Weight Ib (kg)	2517 (1142)	2475 (1123)	3082 (1398)	4700 (2131)	166 x 62 x 84	158 x 60 x 84
Trailer Mounted (1 x w x h ) (in)	150 x 57 x 67	150 x 57 x 67	150 x 57 x 67	166 x 62 x 84		4104 (1860)
Dry Weight lb (kg)	2289 (1038)	2540 (1152)	2853 (1294)	4240 (1923)	4480 (2032)	5062 (2296)
Operating Weight lb (kg)	2758 (1251)	2990 (1356)	3606 (1636)	5410 (2454)	5440 (2468)	Tier 3 Flex
	Interim Tier 4	Interim Tier 4	Interim Tier 4	interim Tier 4	Interim Tier 4	John Deere
Engine	Isuzu	John Deere	Kubota	John Deere	John Deere	PE4045HF285
Brand	4LE1NYGV	PE4024TF281	V3600-T-E3BG	PE4045HFG92	PE4045HFG92	
Model #	Natural	Turbo	Turbo	Turbo	Turbo	Turbo
Aspiration	32 (24)	43 (32)	53 (39)	97 (72)	121 ( <del>9</del> 0)	122 (91)
HP (prime @ 1800rpm) (kW)		149 (2.4)	221 (3.6)	274 (4.5)	275 (4.5)	274 (4.5)
Displacement in <sup>5</sup> (L)	134 (2.2)	4	4	4	4	4
Cylinders	4	1800	1800	1800	1800	1800
Speed (rpm)	1800		3.0 (11.4)	4.78 (18.1)	6.2 (23.5)	6.2 (23.5)
Fuel Consumed prime gph (Lph)	1.8 (6.8)	2.6 (9.8)	1 - 12V/720 CCA	1 - 12V/720 CCA	1 - 12V/720 CCA	1 - 12V/720 CCA
Battery (12 voll)	1 - 12V/720 CCA	1 - 12V/720 CCA	1-1541150 OOM			
Capacities			400 (404)	165 (625)	165 (625)	147 (558)
Fuel Tank gal (L)	106 (401)	108 (401)	106 (401)	31	24.4	22
Approximate Run Time his	45.4	36.9	31	31		
AC Distribution				300	400	400
Iviain Breaker	90	125	200			Switch (Lockable)
Voltage Selection	3 Position S	witch (Lockable)		Switch (Lockable)	+/- 1%	+/- 1%
Voltage Regulation	+/- 1%	+/-1%	+/- 1%	+/- 1%	2	2
120V - 20 amp GFCI Duplex	2	2	2	2	NA NA	NA
240V - 30 amp Twist Lock	NA	NA	NA	NA		3
240V - 50 amp Twist Lock	2	2	2	3	3	•
					4 4964 (4964)	1 - 6000 (2722)
Trailer	1 - 3500 (1588)	1 - 3500 (1588)	1 - 5000 (2268)	1 - 6000 (2722)	1 - 6000 (2722)	
# of Axles & Capacity lbs (kg)	15	15	15	15	15	15
Tire Size (in)	None	Surge	Surge	Surge	Surge	Surge
Brakes	2º Ball	2º Ball	2º Bali	3" Ring	3º Ring	3º Ring
Hitch - Standard					sted above. Cali fact	

## MarkWest Liberty Midstream & Resources L.L.C. Majorsville Gas Plant

## Regeneration Heaters (H-3741, 4741, 5741, 6741, 7741)

Manufacturer:	Heatec
/ear Installed	TBD
uel Used:	Natural Gas
ligher Heating Value (HHV) (Btu/scf):	1,020
eat Input (MMBtu/hr)	7.69
uel Consumption (mmscf/hr):	7.54E-03
Potential Annual Hours of Operation (hr/yr):	8,760

### Criteria and Manufacturer Specific Pollutant Emission Rates

Pollutant	Emission Factor (lb/MMscf) <sup>a,b</sup> 54.4	Potential Emissions (lb/hr) <sup>c</sup> (tons/yr) <sup>d</sup>	
		0.410	1.796
NO <sub>x</sub>	41.82	0.315	1.381
XO	0,6	0.005	0.0198
SO <sub>2</sub>	7.6	0.057	0.2510
M Total	5.7	0.043	0.188
M Condensable	1.9	0.014	0.063
PM <sub>10</sub> (Filterable)	1.9	0.014	0.063
PM <sub>2.5</sub> (Filterable)	5.5	0.041	0.182

### **Regeneration Heaters** (H-3741, 4741, 5741, 6741, 7741)

	Emission Factor (lb/MMscf) <sup>a</sup>	Potential Emissions	
Pollutant		(lb/hr) <sup>e</sup>	(tons/yr) <sup>d</sup>
IAPs:	1.80E-06	1.36E-08	5.94E-08
-Methylchloranthrene	1.60E-05	1,21E-07	5.28E-07
,12-Dimethylbenz(a)anthracene	1.80E-06	1.36E-08	5.94E-08
cenaphthene	1.80E-06	1.36E-08	5.94E-08
Acenaphthylene	2.40E-06	1.81E-08	7.93E-08
Anthracene	1,80E-06	1.36E-08	5,94E-08
Benz(a)anthracene	2.10E-03	1.58E-05	6.93E-05
Benzene	1,20E-06	9.05E-09	3.96E-08
Benzo(a)pyrene	1.80E-06	1.36E-08	5.94E-08
Benzo(b)fluoranthene	1.20E-06	9.05E-09	3,96E-08
Benzo(g,h,i)perylene	1.80E-06	1.36E-08	5.94E-08
Benzo(k)fluoranthene	1.80E-06	1.36E-08	5.94E-08
Chrysene	1.20E-06	9.05E-09	3.96E-08
Dibenzo(a,h) anthracene	1.20E-03	9.05E-06	3.96E-05
Dichlorobenzene	3.00E-06	2.26E-08	9.91E-08
Fluoranthene	2.80E-06	2.11E-08	9,25E-08
Fluorene	7.50E-02	5.65E-04	2.48E-03
Formaldehyde	1.80E+00	1.36E-02	5,94E-02
Hexane	1.80E-06	1.36E-08	5.94E-08
Indo(1,2,3-cd)pyrene	1.70E-05	1.28E-07	5.61E-07
Phenanthrene	5.00E-06	3.77E-08	1.65E-07
Pyrene	3.40E-03	2,56E-05	1.12E-04
Toluene		1.51E-06	6.60E-06
Arsenic	2.00E-04	9.05E-08	3.96E-07
Beryllium	1.20E-05	8.29E-06	3,63E-05
Cadmium	1.10E-03	1.06E-05	4.62E-05
Chromium	1.40E-03	6.33E-07	2.77E-06
Cobalt	8.40E-05	3.77E-06	1,65E-05
Lead	5.00E-04	2,86E-06	1.25E-05
Manganese	3.80E-04	1.96E-06	8.59E-06
Мегсигу	2.60E-04	1,58E-05	6.93E-05
Nickel	2.10E-03	1.81E-07	7.93E-07
Selenium	2.40E-05	1.012.07	
Polycyclic Organic Matter:			7.025.07
Methylnaphthalene (2-)	2.40E-05	1.81E-07	7.93E-07
Naphthalene	6.10E-04	4.60E-06	2.01E-05
Total HAP		1.42E-02	6.24E-02

<sup>&</sup>lt;sup>a</sup> Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3

 $<sup>^{\</sup>rm b}$  NO $_{\rm x}$  and CO emission factors from vendor guarantee.

<sup>&</sup>lt;sup>c</sup> Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf) x (Actual Fuel HHV/1020).

<sup>&</sup>lt;sup>d</sup> Annual Emissions (tons/yr)<sub>Potential</sub> = (lb/hr)<sub>Emissions</sub> × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

### MarkWest Liberty Midstream & Resources L.L.C.

Majorsville Gas Plant

## Hot Oil Heaters (H-3781, 4781, 7781)

Source Designation:	77
Manufacturer:	Heatec
Year Installed	TBD
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,020
Heat Input (MMBtu/hr)	16.07
Fuel Consumption (mmscf/hr):	1.58E-02
Potential Annual Hours of Operation (hr/yr):	8,760

## Criteria and Manufacturer Specific Pollutant Emission Rates

	Emission Factor (lb/MMscf) <sup>a,b</sup>	Potential Emissions	
Pollutant		(lb/hr)°	(tons/yr) <sup>d</sup>
	102	1.607	7.039
10 <sub>x</sub>	84	1.323	5.797
20	0.6	0.009	0.0414
SO <sub>2</sub>	7.6	0,120	0.5244
M Total	5.7	0,090	0.393
M Condensable		0.030	0.131
PM <sub>10</sub> (Filterable)	1.9	0.030	0,131
PM <sub>2.5</sub> (Filterable)	1.9	0.030	0,380
VOC	5.5	0.087	0,500

## Hot Oil Heaters (H-3781, 4781, 7781)

	Emission Factor	Potential Emissions	
Pollutant	(lb/MMscf) <sup>a</sup>	(lb/hr) <sup>c</sup>	(tons/yr) <sup>d</sup>
HAPs:			
3-Methylchloranthrene	1.80E-06	2.84E-08	1.24E-07
7.12-Dimethylbenz(a)anthracene	1,60E-05	2.52E-07	1.10E-06
Acenaphthene	1.80E-06	2.84E-08	1.24E-07
Acenaphthylene	1.80E-06	2.84E-08	1.24E-07
Anthracene	2.40E-06	3.78E-08	1.66E-07
Benz(a)anthracene	1.80E-06	2.84E-08	1.24E-07
	2.10E-03	3.31E-05	1.45E-04
Benzene	1.20E-06	1.89E-08	8.28E-08
Benzo(a)pyrene	1.80E-06	2.84E-08	1.24E-07
Benzo(b)fluoranthene	1.20E-06	1.89E-08	8,28E-08
Benzo(g,h,i)perylene	1.80E-06	2.84E-08	1.24E-07
Benzo(k)fluoranthene	1.80E-06	2.84E-08	1.24E-07
Chrysene	1.20E-06	1.89E-08	8.28E-08
Dibenzo(a,h) anthracene	1.20E-03	1.89E-05	8.28E-05
Dichlorobenzene	3.00E-06	4.73E-08	2.07E-07
Fluoranthene	2.80E-06	4.41E-08	1.93E-07
Fluorene	7,50E-02	1.18E-03	5.18E-03
Formaldehyde	7.30E+02	2.84E-02	1.24E-01
Hexane	1.80E-06	2.84E-08	1.24E-07
Indo(1,2,3-cd)pyrene	1.70E-05	2.68E-07	1.17E-06
Phenanthrene	5.00E-06	7.88E-08	3.45E-07
Pyrene	3.40E-03	5.36E-05	2.35E-04
Toluene		3.15E-06	1.38E-05
Arsenic	2.00E-04	1.89E-07	8.28E-07
Beryllium	1,20E-05	1.73E-05	7.59E-05
Cadmium	1.10E-03	2.21E-05	9,66E-05
Chromium	1.40E-03	1.32E-06	5.80E-06
Cobalt	8.40E-05	7.88E-06	3.45E-05
Lead	5.00E-04	5,99E-06	2.62E-05
Manganese	3.80E-04	4.10E-06	1.79E-05
Mercury	2.60E-04	3.31E-05	1.45E-04
Nickel	2.10E-03	3.31E-03 3.78E-07	1.66E-06
Selenium	2.40E-05	3./0E-U/	1,000-00
Polycyclic Organic Matter:			
Methylnaphthalene (2-)	2.40E-05	3.78E-07	1.66E-06
Naphthalene	6.10E-04	9.61E-06	4.21E-05
Total HAP		2.98E-02	1,30E-01

<sup>&</sup>lt;sup>a</sup> Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3

 $<sup>^{\</sup>rm b}$  NO  $_{\! \rm x}$  and CO emission factors from vendor guarantee.

<sup>°</sup> Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf) x (Actual Fuel HHV/1020).

<sup>&</sup>lt;sup>d</sup> Annual Emissions (tons/yr)<sub>Potential</sub> = (lb/hr)<sub>Emissions</sub> × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

## MarkWest Liberty Midstream & Resources L.L.C.

Majorsville Gas Plant

### Hot Oil Heater (H-1741 & H-2741)

Source Designation:	
Manufacturer:	Tulsa Heaters Inc.
Year Installed	TBD
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,020
Heat Input (MMBtu/hr)	14.25
Fuel Consumption (mmscf/hr):	1.40E-02
Potential Annual Hours of Operation (hr/yr):	8,760

## Criteria and Manufacturer Specific Pollutant Emission Rates

	Emission Factor	Potential Emissions	
Pollutant	(lb/MMscf) <sup>a,b</sup>	(lb/hr) <sup>c</sup>	(tons/yr) <sup>d</sup>
	40.8	0.570	2.497
10x	41.82	0.584	2.559
0	0.6	0.008	0.0367
O <sub>2</sub>	13.26	0.185	0.8114
M Total	5.7	0.080	0.349
M Condensable	1.9	0.027	0.116
PM <sub>10</sub> (Filterable)	1.9	0.027	0.116
PM <sub>2.5</sub> (Filterable)		0,271	1.186
OC .	19.38	V,2/1	

### Hot Oil Heater (H-1741 & H-2741)

	Emission Factor	Potential Emissions	
Pollutant	(lb/MMscf) <sup>a</sup>	(lb/hr) <sup>c</sup>	(tons/yr) <sup>d</sup>
IAPs:			
-Methylchloranthrene	1.80E-06	2.51E-08	1.10E-07
.12-Dimethylbenz(a)anthracene	1.60E-05	2.24E-07	9.79E-07
Acenaphthene	1.80E-06	2.51E-08	1.10E-07
Acenaphthylene	1.80E-06	2.51E-08	1.10E-07
Anthracene	2.40E-06	3.35E-08	1.47E-07
Benz(a)anthracene	1.80E-06	2.51E-08	1.10E-07
Benzene	2.10E-03	2.93E-05	1.29E-04
Benzo(a)pyrene	1.20E-06	1.68E-08	7.34E-08
Benzo(a)pyrene  Benzo(b)fluoranthene	1.80E-06	2.51E-08	1.10E-07
Senzo(g,h,i)perylene	1.20E-06	1.68E-08	7.34E-08
Benzo(k)fluoranthene	1.80E-06	2.51E-08	1.10E-07
Chrysene	1.80E-06	2.51E-08	1.10E-07
nrysene libenzo(a,h) anthracene	1.20E-06	1.68E-08	7.34E-08
Dichlorobenzene	1.20E-03	1.68E-05	7.34E-05
luoranthene	3.00E-06	4.19E-08	1.84E-07
	2.80E-06	3.91E-08	1.71E-07
Fluorene Formaldehyde	7.50E-02	1.05E-03	4.59E-03
	1.80E+00	2.51E-02	1.10E-01
lexane ndo(1,2,3-cd)pyrene	1.80E-06	2.51E-08	1.10E-07
ndo(1,2,3-cd)pyrene Phenanthrene	1.70E-05	2.38E-07	1.04E-06
	5.00E-06	6.99E-08	3.06E-07
Pyrene Coluene	3.40E-03	4.75E-05	2.08E-04
	2.00E-04	2.79E-06	1.22E-05
Arsenic	1.20E-05	1.68E-07	7.34E-07
Beryllium	1.10E-03	1.54E-05	6.73E-05
Cadmium	1.40E-03	1.96E-05	8.57E-05
Chromium	8.40E-05	1.17E-06	5.14E-06
Cobalt	5.00E-04	6.99E-06	3.06E-05
Lead	3.80E-04	5.31E-06	2.33E-05
Manganese	2.60E-04	3.63E-06	1.59E-05
Mercury	2.10E-03	2.93E-05	1.29E-04
Nickel	2.40E-05	3.35E-07	1.47E-06
Selenium	2.101 00		
Polycyclic Organic Matter:	2.40E-05	3.35E-07	· 1.47E-06
Methylnaphthalene (2-)	6.10E-04	8.52E-06	3.73E-05
Naphthalene	0.1VE-V4	0,3217-00	
Total HAP		2.64E-02	1.16E-01

<sup>&</sup>lt;sup>a</sup> Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3

 $<sup>^{\</sup>text{b}}$  NO $_{\text{x}}$  CO, Pṁtotal, and VOC emission factors from vendor guarantee.

<sup>&</sup>lt;sup>c</sup> Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf) x (Actual Fuel HHV/1020).

<sup>&</sup>lt;sup>d</sup> Annual Emissions  $(tons/yr)_{Potential} = (lb/hr)_{Emissions} \times (Maximum Allowable Operating Hours, 8760 hr/yr) \times (1 ton/2000 lb).$ 

## MarkWest Liberty Midstream & Resources L.L.C.

Majorsville Gas Plant

### Hot Oil Heater (H-1782, H-2782)

Source Designation:	
Manufacturer:	Optimized Process Furnaces
Year Installed	TBD
Fuel Used:	Natural Gas
Higher Heating Value (HHV) (Btu/scf):	1,020
Heat Input (MMBtu/hr)	119.20
Fuel Consumption (mmscf/hr):	1.17E-01
Potential Annual Hours of Operation (hr/yr):	8,760

## Criteria and Manufacturer Specific Pollutant Emission Rates

	Emission Factor	Potential Emissions	
Pollutant	(lb/MMscf) <sup>a,b</sup>	(lb/hr)°	(tons/yr) <sup>d</sup>
^	30.60	3.576	15.663
10 <sub>x</sub>	40.8	4.768	20.884
20	0.6	0.070	0.3071
O <sub>2</sub>	7.6	0.888	3.8901
M Total	5.7	0.666	2.918
M Condensable	1.9	0.222	0.973
M <sub>10</sub> (Filterable)		0.222	0.973
PM <sub>2.5</sub> (Filterable)	1.9	0.643	2,815
OC	5.5	0.045	2.010

Majorsville Gas Plant

## Hot Oil Heater (H-1782, H-2782)

	Emission Factor Pote		ential Emissions	
Pollutant	(lb/MMscf) <sup>a</sup>	(lb/hr) <sup>c</sup>	(tons/yr) <sup>d</sup>	
HAPs:				
3-Methylchloranthrene	1.80E-06	2.10E-07	9.21E-07	
7,12-Dimethylbenz(a)anthracene	1.60E-05	1.87E-06	8.19E-06	
Acenaphthene	1.80E-06	2.10E-07	9.21E-07	
Acenaphthylene	1.80E-06	2.10E-07	9.21E-07	
Anthracene	2.40E-06	2.80E-07	1.23E-06	
Benz(a)anthracene	1.80E-06	2.10E-07	9.21E-07	
Benzene	2.10E-03	2.45E-04	1.07E-03	
Benzo(a)pyrene	1.20E-06	1.40E-07	6.14E-07	
Benzo(b)fluoranthene	1.80E-06	2.10E-07	9.21E-07	
Benzo(g,h,i)perylene	1.20E-06	1.40E-07	6.14E-07	
Benzo(k)fluoranthene	1.80E-06	2.10E-07	9.21E-07	
Chrysene	1.80E-06	2.10E-07	9.21E-07	
Dibenzo(a,h) anthracene	1.20E-06	1.40E-07	6.14E-07	
Dichlorobenzene	1.20E-03	1.40E-04	6.14E-04	
Fluoranthene	3.00E-06	3.51E-07	1.54E-06	
Fluorene	2.80E-06	3.27E-07	1.43E-06	
Formaldehyde	7.50E-02	8.76E-03	3.84E-02	
Hexane	1.80E+00	2.10E-01	9.21E-01	
ndo(1,2,3-cd)pyrene	1.80E-06	2.10E-07	9.21E-07	
Phenanthrene	1.70E-05	1.99E-06	8.70E-06	
Pyrene	5.00E-06	5.84E-07	2.56E-06	
Toluene	3.40E-03	3.97E-04	1.74E-03	
Arsenic	2.00E-04	2.34E-05	1.02E-04	
Beryllium	1.20E-05	1.40E-06	6.14E-06	
Cadmium	1.10E-03	1.29E-04	5.63E-04	
Chromium	1.40E-03	1.64E-04	7.17E-04	
Cobalt	8.40E-05	9.82E-06	4.30E-05	
Lead	5.00E-04	5.84E-05	2.56E-04	
Manganese	3.80E-04	4.44E-05	1.95E-04	
Mercury	2.60E-04	3.04E-05	1.33E-04	
Nickel	2.10E-03	2.45E-04	1.07E-03	
Selenium	2.40E-05	2.80E-06	1.23E-05	
Joiennan				
Polycyclic Organic Matter:				
Methylnaphthalene (2-)	2.40E-05	2.80E-06	1.23E-05	
Naphthalene	6.10E-04	7.13E-05	3.12E-04	
Total HAP		2.21E-01	9.67E-01	

<sup>&</sup>lt;sup>a</sup> Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1, 1.4-2, & 1.4-3

 $<sup>^{\</sup>rm b}$  NO  $_{\rm x}$  and CO emission factors from vendor guarantee.

<sup>&</sup>lt;sup>c</sup> Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf) x (Actual Fuel HHV/1020).

<sup>&</sup>lt;sup>d</sup> Annual Emissions (tons/yr)<sub>Potential</sub> =  $(lb/hr)_{Emissions} \times (Maximum Allowable Operating Hours, 8760 hr/yr) \times (1 ton/2000 lb)$ .

#### MarkWest Liberty Midstream & Resources L.L.C. Majorsville Gas Plant

#### Fugitive Emissions from Component Leaks

		Component	TOC Emission Factor <sup>3</sup>	Average NG Leak Rate	VOC	HAP Wt	Potential VOC Emissions	Potentia HAP Emission
Component	Service Type	Count <sup>2</sup>	(kg/hr/component)	(lb/hr)	Wt% <sup>4</sup>	%	(tpy)	(tpy)
Compressors	Gas	32	1.32E-03	0.09	0.50%	0.00%	0.00	0.00
Compressors	Light Oil	1	1.13E-03	0.00	100.00%	1.49%	0.01	0.00
Flange	Gas	2,907	2.73E-04	1.75	100.00%	0.27%	7.67	0.02
Flange	Gas	1,843	2.73E-04	1.11	20.00%	0.27%	0.97	0.01
Flange	Gas	71	2.73E-04	0.04	0.50%	0.00%	0.00	0.00
Flange	Light Oil	2,436	7.70E-05	0.41	100.00%	1.49%	1.81	0.03
Flange	Light Oil	37	7.70E-05	0.01	0.50%	1.49%	0.00	0.00
Flange	Heavy Oil	2	2.73E-07	0.00	100.00%	1.49%	0.00	0.00
Connector	Gas	8,069	1.40E-04	2.49	100.00%	0.27%	10.92	0.03
Connector	Gas	6,457	1.40E-04	1.99	20.00%	0.27%	1.75	0.02
Connector	Gas	149	1.40E-04	0.05	0.50%	0.00%	0.00	0.00
Connector	Light Oil	4,765	1.47E-04	1.55	100.00%	1.49%	6.77	0.10
Connector	Light Oil	181	1.47E-04	0.06	0.50%	1.49%	0.00	0.00
PRD	Gas	62	2.64E-04	0.04	100.00%	0.27%	0.16	0.00
PRD	Gas	142	2.64E-04	0.08	20.00%	0.27%	0.07	0.00
PRD	Gas	8	2.64E-04	0.00	0.50%	0.00%	0.00	0.00
PRD	Light Oil	42	2.25E-04	0.02	100.00%	1.49%	0.09	0.00
Pump	Gas	28	3.60E-04	0.02	100.00%	0.27%	0.10	0.00
Pump	Light Oil	38	1.95E-03	0.16	100.00%	1.49%	0.72	0.01
Valve	Gas	3,390	1.35E-04	1.01	100.00%	0.27%	4.42	0.01
Valve	Gas	3,160	1.35E-04	0.94	20.00%	0.27%	0.82	0.01
Valve	Gas	280	1.35E-04	0.08	0.50%	0.00%	0.00	0.00
Valve	Heavy Oil	2	2.52E-07	0.00	100.00%	1.49%	0.00	0.00
Valve	Heavy Oil	17	2.52E-07	0.00	0.50%	1.49%	0.00	0.00
Valve	Light Oil	2,888	7.50E-05	0.48	100.00%	1.49%	2.09	0.03
Valve	Light Oil	161	7.50E-05	0.03	0.50%	1.49%	0.00	0.00
			Total	12.4	48 34		38.376	0.287

<sup>1. &</sup>quot;Other" equipment types include compressor seals and relief valves.

<sup>2.</sup> Component counts are actual counts from LDAR contractor and estimations for Majorsville VII and DeEth II based on Majorsville VI and DeEth I component counts.

<sup>3.</sup> Table 2-4:Oil & Gas Production Operations Average Emission Factors, Protocol for Equipment Leak Emission Estimates, EPA 453/R-95-017, November 1995 with applied reduction percentages from NSPS Subpart OOOO monitoring program per TCEQ Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives October 2000. Emission factors based on average measured TOC from component types indicated in gas service at O&G Production Operations.

<sup>4.</sup> VOC and HAP weight percent based on most conservative monthly gas analysis 2016. For HAPs the C6+ were speciated using a typical lumped C6+ gas analysis from GRI-GLYCalc estimations to determine hazardous constituents.

#### Plant Flare (FL-1991)

Manufacturer:	Callidus
Year Installed	2012/2013
Operating Hours: (hr/yr)	8,760
Flow Rate per Pilot (scfm)	1.39
Number of Pilots	5.00
Pilot Gas Volume (scfm)	6.95
Purge Gas Volume (scfm)	0.00
Annual Fuel Use (MMBtu/yr)	3,726
Annual Fuel Use (mmscf/yr)	3.65
Fuel Consumption (mmscf/hr):	4.2E-04
Fuel HHV (Btu/scf)	1,020

#### Criteria and Manufacturer Specific Pollutant Emission Rates

	Emission Factor	Potential Emissions		
Pollutant	(lb/MMscf) <sup>a</sup>	(lb/hr) <sup>b</sup>	(tons/yr) <sup>c</sup>	
$NO_x$	100	0.042	0.183	
CO	84	0.035	0.153	
SO <sub>2</sub>	0.6	0.000	0.001	
PM Total	7.6	0.003	0.014	
PM Condensable	1.9	0.001	0.003	
PM <sub>10</sub> (Filterable)	5.7	0.002	0.010	
PM <sub>2.5</sub> (Filterable)	5.7	0.002	0.010	
VOC	5.5	0.002	0.010	

<sup>&</sup>lt;sup>a</sup> Emission factors from AP-42 Section 1.4 "Natural Gas Combustion" Tables 1.4-1.

## Combustion of Hydrocarbons

Hourly maintenance emissions (lb/hr) <sup>b</sup>	348.43
Annual maintenance emissions (tpy) <sup>b</sup>	45,20
MW	20.44
Hourly Gas Flow (scf/hr)	6,462
Annual Gas Flow (mmscf/yr)	1.68
Heating value (btu/scf)	1,020.00
Maximum Heat Release of Flare (mmbtu/hr)	6.6
Maximum Heat Release of Flare (mmbtu/yr)	554
NO <sub>X</sub> Emission Rate (lb/mmbtu)	0.068
CO Emission Rate (lb/mmbtu)	0.37

a Emission factors from AP-42 Section 13.5 "Industrial Flares"
Table 13.5-1

### Total Emissions

Pollutant	lb/hr	tpy	
NO <sub>X</sub>	0.4899	0,2015	
СО	2.4738	0,2559	
SO <sub>2</sub>	0,0003	0.0011	
PM Total	0.0032	0.0139	
PM Condensable	0.0008	0.0035	
PM <sub>10</sub> (Filterable)	0.0024	0.0104	
PM <sub>2.5</sub> (Filterable)	0.0024	0.0104	
VOC	0.0023	0.0100	

<sup>&</sup>lt;sup>b</sup> Emission Rate (lb/hr) = Rated Capacity (MMscf/hr) × Emission Factor (lb/MMscf).

 $<sup>^{\</sup>rm c}$  Annual Emissions (tons/yr)<sub>Potential</sub> = (lb/hr)<sub>Emissions</sub> × (Maximum Allowable Operating Hours, 8760 hr/yr) × (1 ton/2000 lb).

<sup>&</sup>lt;sup>b</sup> Includes emissions from pump maintenance and pigging

### MarkWest Liberty Midstream and Resources, L.L.C. Majorsville Gas Plant Pump Maintenance

Standard Volume (scf)	2000
Moles Emitted (moles/event)	5.28
MW	20.44
Event Emissions (lb/event)	107.84
Control Percentage	98%
Annual Events	24

Pollutant	Mass %	Emissions		
Pondiant	IVIdSS 70	lb/hr	tpy	
VOC	17.39%	0.38	0.00	
Total HAPs	0.83%	0.02	0.00	
Benzene	0.83%	0.02	0.00	
Toluene	0.27%	0.01	0.00	
Ethylbenzene	0.27%	0.01	0.00	
Xylenes	0.09%	0.00	0.00	
n-Hexane	0.83%	0.02	0.00	

### MarkWest Liberty Midstream and Resources, L.L.C. Majorsville Gas Plant Pig Receiver

Receiver Diameter (inches)	20
Receiver Length (ft)	30.83
Receiver Volume (ft3)	67.25
Pressure (psig)	960.65
Temperature (°F)	60
Standard Pressure (psia)	14.7
Standard Temperature (°F)	60
Standard Volume (scf)	4462.06
Moles Emitted (moles/event)	11.77
MW	20.44
Event Emissions (lb/event)	240.59
Control Percentage	98%
Annual Events	365

Pollutant	Mass %	Emissions		
	IVIA55 /6	lb/hr	tpy	
VOC	17.39%	0.84	0.15	
Total HAPs	0.83%	0.04	0.01	
Benzene	0.83%	0.04	0.01	
Toluene	0.27%	0.01	0.00	
Ethylbenzene	0.27%	0.01	0.00	
Xylenes	0.09%	0.00	0.00	
n-Hexane	0.83%	0.04	0.01	

Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans

## Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans

MarkWest Liberty Midstream & Resources LLC is not submitting any additional plans other than those recommendations noted in the Emissions Unit Data Sheets, Attachment L. Since the heaters are permitted for the maximum capacity of heater plus 10% and are scheduled to be operational 8,760 hours per year there will be no additional recordkeeping requirements.

## **Attachment P: Affadavit of Publication**

### Attachment P: Affidavit of Publication

MarkWest Liberty Midstream & Resources LLC has published a public notice in the Intelligencer newspaper, headquartered in Wheeling, WV. This paper serves the geographical area surrounding Majorsville.

The affidavit issued by the paper showing the date of publication and the actual text is attached following the proposed text:

## AIR QUALITY PERMIT NOTICE Notice of Application

Notice is given that MarkWest Liberty Midstream & Resources LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a modification for a natural gas processing plant located on Route 15, Calis Majorsville Road, near Majorsville, in Marshall County, West Virginia. The latitude and longitude coordinates are: N 39.9636 W 80.5206.

The applicant estimates a change in the potential to discharge the following Regulated Air Pollutants will be increases of 16.76 tons per year  $NO_x$ , 20.66 tons per year CO, 4.59 tons per year PM, and 0.33 tons of PM.

Startup of operation is planned to begin on or about December 11, 2017. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57<sup>th</sup> Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1227, during normal business hours.

Dated this the 5th day of December 2016.

By: MarkWest Liberty Midstream & Resources LLC

Leanne Meyer, VP of EH&S 1515 Arapahoe St. Tower 1, Suite 1600 Denver, CO 80202-2137

### **Application Fee**

Per WV Rule 13 & 22 (45CSR13 & 45CSR22), Title 45, Series 22, Section 3.4.a, a fee of \$1,000 must be submitted with the Permit to Modify with an additional fee of \$1,000 for being subject to NSPS requirements.

MarkWest Liberty Midstream & Resources LLC hereby submits a check for the total \$2,000.00, payable to: WVDEP/DAQ.